Exhibit D

Page 1

IN THE UNITED STATES BANKRUPTCY COURT

FOR THE DISTRICT OF DELAWARE

- x

In re: Chapter 11
                                Case No. 22-11068
FTX TRADING LTD., et al.,   (JTD)

          Debtors.

- x

          Deposition of KEVIN LU, taken
pursuant to notice, was held at the law
offices of SULLIVAN & CROMWELL LLP, 125
Broad Street, New York, New York,
commencing March 1, 2024, 9:00 a.m., on
the above date, before Leslie Fagin, a
Court Reporter and Notary Public in the
State of New York.

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19   SHMUEL BULKA
20   CHING WATSON
21   FOTIS KONSTANTINIDIS
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23
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 1           K. Lu
 2   K E V I N  L U,  called as a witness,
 3       having been duly sworn by a Notary
 4       Public, was examined and testified as
 5       follows:
 6   EXAMINATION BY
 7   MR. APPLEBAUM:
 8       Q.  Good morning, Mr. Lu.  My name is
 9   Aaron Applebaum.  I'm an attorney with DLA
10   Piper.  I represent Maps Limited.
11           Can you please state and spell your
12   full name?
13       A.  My name is Kevin Lu.  My last name
14   is spelled L-U.
15       Q.  Are you taking any medication that
16   might prevent you from understanding my
17   questions and providing complete answers
18   today?
19       A.  No.
20       Q.  Have you ever been deposed before?
21       A.  No, it's my first time.
22       Q.  Have you ever testified in court
23   before?
24       A.  I testified at the hearing on
25   January 31st in this matter.
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 1           K. Lu
 2       Q.  Have you testified in any other
 3   cases before that?
 4       A.  No, I haven't.
 5       Q.  Just before we start with
 6   questions, I want to go over a few general
 7   principles or ground rules.
 8           You understand that you are under
 9   oath?
10       A.  Yes.
11       Q.  And that means the same penalty of
12   perjury applies as if you were in court even
13   though we are just sitting in a conference
14   room today, you that understand?
15       A.  I understand.
16       Q.  And a transcript of your testimony
17   is going to be prepared and that can be used
18   as evidence in a trial in this case, you
19   understand that?
20       A.  Yes.
21       Q.  You understand that you need to
22   answer audibly or verbally using yes or no
23   and not with a nod or shake of your head, you
24   understand that?
25       A.  Yes.
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 1          K. Lu
 2      Q.  I will ask that you please wait for
 3  me to ask my full question before you answer
 4  so that we don't talk over each other and I
 5  will try not to talk over your answer as
 6  well, is that all right?
 7      A.  Sure.
 8      Q.  If you don't understand a question,
 9  please say so.  If you answer without saying
10  you didn't understand, I'm going to assume
11  that you understood the question, does that
12  make sense?
13      A.  Yes.
14      Q.  If at any time you need a break,
15  just let me know.  The only thing I ask is if
16  there is a question pending, that you answer
17  the question before we take a break, does
18  that make sense?
19      A.  Sure, thank you.
20      Q.  Another one of the attorneys here
21  may note on objection to one of my questions
22  to preserve the record.  Unless you are told
23  not to answer, you will still need to respond
24  to the question that's been asked, okay?
25      A.  I understand.
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 1          K. Lu
 2      Q.  What's your educational background?
 3      A.  I studied at the University of
 4  California Berkeley where I received a
 5  bachelor's in business administration and
 6  economics.
 7      Q.  Do you have any postgraduate
 8  degrees or any other degrees beyond the
 9  bachelor's degree?
10      A.  No, just my bachelor degrees.
11      Q.  What were your areas of study at
12  Berkeley?
13      A.  I received a bachelor's in business
14  administration and a bachelor's in economics.
15      Q.  Have you done any specific study
16  relating to cryptocurrency?
17      A.  My professional experience relates
18  to applying data science to financial data
19  and I've been in the cryptocurrency industry
20  full-time for the past five years where I
21  regularly interact with price and data from
22  various sources.
23      Q.  Do you have any academic study,
24  academic background in cryptocurrency?
25      A.  No.  When I studied, cryptocurrency
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 1          K. Lu
 2  weren't invented yet, so it was impossible to
 3  have any academic study on cryptocurrency at
 4  that time.
 5      Q.  Do you have any academic background
 6  -- have you taken any academic courses
 7  relating to asset valuation?
 8      A.  In my undergrad studies, there were
 9  courses on asset valuation and finance which
10  I took.
11      Q.  Those were all at Berkeley as well?
12      A.  Yes.
13      Q.  Do you remember what courses you
14  took relating to asset valuation at Berkeley?
15      A.  I can't recall the specific
16  courses.  All I know is that I studied these
17  topics.
18      Q.  What year did you graduate from
19  Berkeley?
20      A.  2006.
21      Q.  Have you taken any other courses or
22  seminars relating to cryptocurrency in the
23  last 10 years?
24      A.  No formal courses, although as I
25  said before, I have been engaged full-time in
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 1          K. Lu
 2  the cryptocurrency industry for the past five
 3  years.
 4      Q.  Have you taken any courses or
 5  seminars relating to asset valuation in the
 6  last 10 years?
 7      A.  No, I haven't.
 8      Q.  Have you ever taught any courses or
 9  seminars relating to cryptocurrency or asset
10  valuation?
11      A.  No, I haven't.
12      Q.  Have you published any papers or
13  articles?
14      A.  I published articles as part of my
15  job at Coin Metrics, through white papers
16  that are published relating to
17  cryptocurrency.
18      Q.  Where are those white papers
19  published?
20      A.  On Coin Metrics website, I believe
21  a list of those publications are included in
22  my CV.
23      Q.  Have you published any papers or
24  articles in any academic journals or any
25  other kind of peer reviewed sources?
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 1          K. Lu
 2      A.  No, I haven't.
 3      Q.  Can you describe your professional
 4  work experience relating to cryptocurrency
 5  and asset valuation?
 6      A.  Sure.  So for the past five years,
 7  I've been working at Coin Metrics.  I joined
 8  when the company was just founded and had
 9  zero revenue, zero commercial products.  I
10  played a role in developing the Coin Metrics'
11  prices which is one of the commercial data
12  products offered at Coin Metrics.
13          The Coin Metrics' prices are a
14  series of prices that we publish that are
15  used by our clients for a variety of purposes
16  like accounting, financial reporting,
17  settling financial contracts, research
18  purposes, backtesting purposes, audits and
19  other purposes.
20          I've played a key role in
21  developing this product, including developing
22  the methodology and for the past five years,
23  I've -- I or others at my direction have
24  monitored the performance of the prices
25  during times of market stress or during
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 1          K. Lu
 2  volatile periods.
 3          In the development of the Coin
 4  Metrics' prices, I researched extensively the
 5  literature, the academic literature and the
 6  industry literature and those were all
 7  incorporated in the methodology that I
 8  developed for the Coin Metrics' prices.
 9      Q.  You also worked at some point prior
10  to Coin Metrics for a company called NERA
11  N-E-R-A, Economic Consulting, is that right?
12      A.  That's right.
13      Q.  What years did you work there?
14      A.  I believe it was 2006 to 2008.
15      Q.  Did your work there involve
16  cryptocurrency or asset valuation?
17      A.  Again, during that period of time,
18  cryptocurrency weren't invented yet so it
19  didn't involve cryptocurrency.
20          My work at NERA mainly involved
21  calculating damages in connection with
22  securities litigation, so indirectly, it
23  involved calculating prices.
24      Q.  Did it involve asset valuation?
25      A.  I don't believe it involved asset
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 1          K. Lu
 2  valuation.
 3      Q.  One of the services that NERA
 4  provided was expert testimony, is that right?
 5      A.  That's right.
 6      Q.  But you, I think you said this was
 7  the first time you have testified in this
 8  case, is that right?
 9      A.  That's right.
10      Q.  So you weren't a testifying witness
11  when you worked at NERA, is that right?
12      A.  I was not a testifying witness,
13  that's right.
14      Q.  You also worked at Edgeworth
15  Economics?
16      A.  Yes.
17      Q.  What years was that?
18      A.  I can't recall actually.  I believe
19  it was 2011 to 2013.
20      Q.  Did your work at Edgeworth involve
21  asset valuation?
22      A.  No, not directly.
23      Q.  That's also a company that provided
24  expert testimony, is that right?
25      A.  That's right.
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 1          K. Lu
 2      Q.  But you similarly were not a
 3  testifying witness when you worked at
 4  Edgeworth, is that right?
 5      A.  That's correct.
 6      Q.  You also worked at Bridgewater
 7  Associates?
 8      A.  That's right.
 9      Q.  What did you do at Bridgewater
10  Associates?
11      A.  I initially worked in their data
12  team where I maintained datasets that are
13  used in their systematic trading systems.
14          I later expanded my
15  responsibilities to publishing the
16  Bridgewater Daily Observations which is a
17  subscription newsletter sent to policymakers
18  and institutional investors.
19      Q.  Did Bridgewater also provide expert
20  testimony as one of its services?
21      A.  No, they're a hedge fund.
22      Q.  You also worked at Element Group?
23      A.  That's right.
24      Q.  That was the most recent -- your
25  most recent job before working at Coin
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 1           K. Lu
 2   Metrics, is that right?
 3       A.   That's correct.
 4       Q.   What did you do at Element Group?
 5       A.   I was responsible for engineering
 6   the firm's systematic trading policies and
 7   developing systematic and algorithmic trading
 8   strategies for the firm and the firm engaged
 9   in cryptocurrency trading.
10       Q.   You said Element was engaged in
11   cryptocurrency trading?
12       A.   That's right.
13       Q.   What was your title at Element?
14       A.   It was director of quantitative
15   analysis.
16       Q.   What years were you at Element?
17       A.   I believe it was 2018 to 2019.
18       Q.   Did Element provide expert
19   testimony as one of its services for its
20   clients?
21       A.   No.
22       Q.   What's your current title at Coin
23   Metrics?
24       A.   It's director of data science and
25   product.
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 1           K. Lu
 2       Q.   Are you a data scientist?
 3       A.   Yes, I consider myself a data
 4   scientist.
 5       Q.   What's the basis for that position?
 6       A.   The basis is that was the title
 7   given to me and I perform applications of
 8   data science on a daily basis in my work.
 9       Q.   Do you have any formal academic
10   training in the field of data science?
11       A.   The degrees that I have don't
12   contain the word data science, but I believe
13   that the things that I learned in my
14   undergrad degree, I apply these learnings in
15   my day to day work.
16       Q.   Can you explain a little bit more
17   about how -- let me rephrase.
18           Did you learn anything at Berkeley
19   in the field of data science?
20       A.   I learned how to analyze data, I
21   learned how to program.  Both of these skills
22   I utilize today as a data scientist.
23       Q.   Did you take any courses that had
24   the words data science in the name or as part
25   of the curriculum?
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 1           K. Lu
 2       A.   No.  As I recall, the term data
 3   science didn't really become commonly used
 4   until, say, about 10 years ago.
 5           At the time, Berkeley did not have
 6   a data science degree, so, no, it did not
 7   have the term data science in them.
 8       Q.   Since graduating from Berkeley,
 9   have you taken any courses or seminars in the
10   field of data science?
11       A.   No, I haven't.
12       Q.   Do you hold any licenses or
13   certifications?
14       A.   No, I don't.
15       Q.   Professional licenses or
16   certifications?
17       A.   No, I don't.
18       Q.   Have you ever held a professional
19   license or certification?
20       A.   No, I haven't.
21       Q.   Have you ever been subject to any
22   professional disciplinary action?
23       A.   No, I haven't.
24       Q.   Are you a member of any
25   professional or industry organizations
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 1           K. Lu
 2   relating to cryptocurrency?
 3       A.   No, I am not.
 4       Q.   Are you a member of any
 5   professional or industry organizations
 6   relating to asset valuation?
 7       A.   No.
 8       Q.   Are you a member of any
 9   professional or industry organizations
10   relating to data science?
11       A.   No.
12       Q.   What did you do to prepare for
13   today's deposition?
14       A.   I reviewed my initial declaration,
15   I reviewed the expert report of Mr.
16   Konstantinidis, I reviewed my response to
17   that report, I met with counsel at Sullivan &
18   Cromwell to prepare for the deposition and I
19   also reviewed some of the discovery materials
20   that I produced.
21       Q.   How many times did you meet with
22   Sullivan & Cromwell?
23       A.   One time.
24       Q.   Do you remember who was present
25   from Sullivan & Cromwell?
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1   K. Lu
2   A.   Yes, it was Brian Glueckstein,
3   Julie Kapoor, Ed LoBello and also Shmuel
4   Bulka which is general counsel at Coin
5   Metrics.
6   Q.   Ed LoBello is not at Sullivan &
7   Cromwell, right, it's Coin Metrics' counsel?
8   A.   Right, he is external counsel to
9   Coin Metrics.
10   Q.   That was one meeting with those
11 attorneys?
12   A.   That's right.
13   Q.   Do you remember about how long that
14 meeting lasted?
15   A.   About an hour and a half.
16   Q.   Did you talk to anybody else in
17 preparation for this deposition?
18   A.   No, I didn't.
19   Q.   Have you ever previously worked on
20 a case for a party represented by Sullivan &
21 Cromwell before this one?
22   A.   No.
23   Q.   Have you ever worked on a case in a
24 matter involving issues relating to
25 cryptocurrency or asset valuation in a court

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1   K. Lu
2   proceeding?
3   A.   No.
4   Q.   Have you ever issued an opinion or
5   declaration that was provided to a court
6   prior to the FTX bankruptcy case?
7   A.   No, I haven't.
8   Q.   Do you have any personal or
9   financial relationships with any other
10 parties or counsel in this case?
11   A.   No, I don't.
12   Q.   Have you ever been proposed as an
13 expert witness in a case, but the court
14 declined to qualify you as an expert witness?
15   A.   No.
16   Q.   Is the FTX the first case that
17 you've ever been presented as an expert
18 witness?
19   A.   I'm not certain if I'm an expert
20 witness or not, but yes, this is the first
21 case that I've been involved in testifying
22 like that.
23   Q.   Have you ever offered testimony in
24 a case on a nonexpert basis?
25   A.   No, I haven't.

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1   K. Lu
2   Q.   How much have you been paid for
3   your work in the FTX bankruptcy proceedings?
4   A.   Personally, I have not been paid
5   anything, but the company is being
6   compensated.
7   Q.   What is the -- how is Coin Metrics
8   being compensated for its work in this case?
9   A.   I wasn't involved in the commercial
10 discussions, but I believe that we were
11 compensated with a fixed fee for pricing a
12 certain number of assets, that was expanded
13 to a certain amount because we were asked to
14 price additional assets and then we were
15 compensated on an hourly basis for any
16 supplemental work that was outside of that
17 initial scope of work.
18   Q.   Do you know, what is your hourly
19 rate that Coin Metrics is charging for your
20 time on this supplemental work?
21   A.   I don't know the hourly rate
22 actually.
23   Q.   What did you understand to be your
24 or Coin Metrics' assignment in connection
25 with the FTX case?

Page 21

1   K. Lu
2   A.   So the scope of my assignment was
3   to price certain digital assets that were at
4   one point listed on the FTX exchanges as of
5   the petition time.
6   I was also asked to calculate a
7   confidence interval reflecting the
8   uncertainty in the determination of the
9   price. I was also asked to produce some
10 output representing the intermediate
11 calculations of the price and I was also
12 asked to write a declaration explaining the
13 methodology and my final results.
14   Q.   Can you explain what you mean by
15 intermediate calculations?
16   A.   Sure. So the final output would
17 just be the price itself, but the
18 intermediate output could be things like
19 which constituent markets were used in the
20 calculation of the price or which trades were
21 used in the calculation of the price.
22   Q.   Did you receive any specific
23 instructions for performing your work from
24 anyone at FTX or Sullivan & Cromwell?
25   A.   Beyond the scope of work that I

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K. Lu

1 just explained to you, no, I felt like I had
2 complete independence in how to perform my
3 analysis and I did not receive instruction
4 from anyone on how to perform the analysis.
5 Q. Did you receive any instruction
6 from anyone at Coin Metrics with respect to
7 how to perform your analysis?
8 A. No.
9 Q. Was there any subject or assignment
10 on which you were asked to perform an
11 analysis, but you declined to do so?
12 A. No.
13 Q. When was Coin Metrics first
14 retained in this matter?
15 A. I can't recall the specific dates,
16 but it was in late 2023.
17 Q. Do you know how that retention was
18 brought about?
19 A. Again, I wasn't part of the
20 commercial discussions, but I believe that
21 Alvarez & Marsal had reached out to Coin
22 Metrics and others at Coin Metrics handled
23 the commercial discussions, the initial
24 discussions.

Page 23

K. Lu

1 Q. Who at Coin Metrics would have
2 handled those commercial discussions with
3 Alvarez & Marsal?
4 A. To my knowledge, there is one
5 individual, Luke McDonald. He is a member of
6 our sales team at Coin Metrics. He was one
7 of the primary contacts between Coin Metrics
8 and Alvarez & Marsal.
9 Q. How much time would you say you
10 spent on this assignment for FTX?
11 A. I would say in excess of 200 hours.
12 Q. How much of that time was spent to
13 get to the point of preparing the initial
14 analysis and the declaration that was filed
15 with the Bankruptcy Court?
16 A. Roughly, I would say 150 hours for
17 the initial declaration and the remainder of
18 the time for all the subsequent work.
19 Q. Can you describe, at a general
20 level, what work it was that you did in order
21 to fulfill the assignment?
22 A. Sure. So one was just receiving
23 the data, the assets that we were asked to
24 price and mapping that data to Coin Metrics'

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K. Lu

1 internal dataset.
2 My work then involved applying the
3 pricing methodology to calculate the prices
4 for those assets as well as calculating the
5 confidence interval for those assets as well
6 as producing the intermediate output for
7 those assets.
8 Time was then spent on thoroughly
9 checking the outputs and I also spent time on
10 writing the declaration.
11 Q. Did you perform any services or
12 take any actions beyond that which you were
13 originally asked to do?
14 MR. GLUECKSTEIN: Objection to
15 form.
16 A. No, I don't believe so.
17 Q. What information including
18 documents did you view to form your opinions
19 or to perform your analysis?
20 A. I reviewed materials sent to me by
21 Alvarez & Marsal. They were spreadsheets
22 listing the assets that were listed on FTX.
23 I also reviewed some output from
24 FTX's internal database, again, provided by

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K. Lu

1 Alvarez & Marsal containing the full name of
2 those assets. I also reviewed Coin Metrics'
3 internal data sets surrounding the petition
4 time.
5 Q. So the only -- is it correct that
6 the only information that you received from
7 Alvarez & Marsal were spreadsheets that just
8 listed the names of the different digital
9 assets that you were being asked to value?
10 A. It contained the names and they had
11 also categorized the assets into different
12 categories such as whether it's a digital
13 asset or a futures contract or leverage token
14 and so on.
15 Q. Other than listing the assets and
16 grouping them by category, there wasn't any
17 other substantive data or information
18 provided by Alvarez & Marsal?
19 A. That's right, that was the only
20 information that was provided to me and that
21 I reviewed.
22 Q. Can you describe more the output
23 from FTX's database that you were provided?
24 A. Yes, I had requested some

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K. Lu

1
2 additional information because some of the
3 initial spreadsheets provided to me by
4 Alvarez & Marsal just contained the ticker of
5 the digital asset, and by ticker, I mean a
6 symbol, it could be a three or four-letter
7 symbol as an example, but that is not enough
8 to uniquely identify an asset because certain
9 assets can share the same ticker or symbol.
10   So in order to uniquely identify
11 the asset and accurately map that asset to
12 Coin Metrics' internal data, I requested the
13 full name of that digital asset so that I
14 could properly identify that asset.
15   Q. Is that the extent of what you
16 received from the FTX database was something
17 with the full name of the digital assets?
18   A. That's right. The database output
19 that I received contained the symbol, the
20 full name and I believe it also contained the
21 last price within the FTX database.
22   Q. That last price within the FTX
23 database, that would have been as of what
24 date and time?
25   A. I don't know what date or time, it

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K. Lu

1
2 wasn't provided to me.
3   Q. Do you have an understanding of
4 whether it was prior to the petition date or
5 not?
6   A. I don't know.
7   Q. Do you know who at FTX prepared
8 that data that you were provided?
9   A. No, I don't, I had asked Alvarez &
10 Marsal to produce it and I don't know how
11 exactly they produced it.
12   Q. So when you received it, did you
13 receive it directly from FTX or from Alvarez
14 & Marsal?
15   A. I received it directly from Alvarez
16 & Marsal.
17   Q. And who at Alvarez & Marsal
18 provided you with that data?
19   A. I can't recall the exact
20 individual, but I regularly interacted with
21 Kumanan at Alvarez & Marsal.
22   Q. So is it correct then that the
23 extent of the information that you were
24 provided, and by that I mean information
25 beyond what's at the Coin Metrics' internal

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K. Lu

1
2 dataset, the extent is a spreadsheet from
3 Alvarez & Marsal listing names of assets and
4 then another spreadsheet from FTX with the
5 complete names of the assets along with last
6 price on the FTX exchange?
7   A. That's correct.
8   Q. You weren't provided with any other
9 information that you chose not to review as
10 part of your analysis?
11   A. No, I was not.
12   Q. Did you receive any information
13 from the lawyers for FTX in this case at
14 Sullivan & Cromwell?
15   A. No, they did not send me any
16 documents.
17   Q. Did you rely on or work with anyone
18 else in connection with this assignment?
19   A. Yes, I worked with two individuals
20 that are part of my team. One is Victor
21 Ramirez, he is a senior data scientist at
22 Coin Metrics. The other individual is Uriel
23 Morone, U-R-I-E-L, M-O-R-O-N-E, he is also a
24 senior data scientist at Coin Metrics.
25   Q. Are Victor and Uriel senior or

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K. Lu

1
2 junior to you at Coin Metrics?
3   A. They report directly to me.
4   Q. What services or work did they
5 perform as part of this assignment?
6   A. Uriel was responsible for
7 implementing the actual calculation
8 methodology for calculating the price and
9 confidence interval and Victor was
10 responsible for producing the intermediate
11 output.
12   Q. Why did you rely on them to perform
13 those tasks?
14   A. Just a segregation of
15 responsibilities. I needed their help to
16 accomplish the assignment in the given
17 timeframe.
18   Q. What are their qualifications,
19 let's start with Victor?
20   A. It's hard to remember his exact CV
21 as I sit here, but he previously worked as a
22 data scientist in a consulting firm. I
23 believe he has a bachelor's degree in
24 physics. I can't recall the exact university
25 he studied at.

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K. Lu

1
2   For Uriel, he has a Ph.D. in
3 physics. Again, I can't remember the exact
4 university he studied at and he previously
5 worked as a data scientist at Amazon.com,
6 among other companies.
7   Q. And the work that they did in
8 implementing the calculations and preparing
9 the intermediate datasets, was that all done
10 under your supervision?
11   A. Yes.
12   Q. What did you do to supervise that
13 work?
14   A. Prior to them executing the work, I
15 had high level discussions on the methodology
16 and how it's implemented.
17   Subsequent to them producing their
18 work, I thoroughly examined their source code
19 and output.
20   Q. Did anyone else at Coin Metrics
21 review or supervise the work that was done
22 for this assignment?
23   A. In terms of the actual analysis,
24 those were the only two individuals involved.
25   For the declaration, Shmuel Bulka,

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K. Lu

1
2 general counsel at Coin Metrics, reviewed the
3 declaration as well as Ed LoBello.
4   Q. Any other nonlawyers review the
5 declaration?
6   A. No.
7   Q. Other than the employees at Coin
8 Metrics, did you speak with any other fact
9 witnesses in this case in connection with
10 performing your work?
11   A. I don't understand the term fact
12 witness.
13   Q. Did you speak with anybody who was
14 employed by FTX?
15   A. No.
16   Q. Did you speak with anyone at
17 Alvarez & Marsal regarding the assignment?
18   A. Yes.
19   Q. Who would that have been?
20   A. I primarily spoke with Kumanan, I
21 forget his last name, I apologize. I believe
22 there were also one or two other individuals
23 at A&M and, again, I forget their names.
24   Q. What was the substance of your
25 discussions with the individuals at A&M?

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K. Lu

1
2   A. Mainly it was just how to interpret
3 the output that they sent me and also
4 confirming whether or not I had done an
5 accurate mapping of the symbols that I had
6 received to Coin Metrics' internal data.
7   Q. So those discussions were limited
8 to just making sure you had the correct
9 identification of the digital assets you were
10 being asked to price and value, is that
11 right?
12   A. Yes.
13   Q. Did you communicate with any other
14 of the expert witnesses who had been employed
15 in this case?
16   A. The only contact I've had with
17 Professor Howell was at the hearing on
18 January 31st where we exchanged pleasantries.
19 I have not talked to her about any
20 substantive -- about her analysis or
21 substantive matter at hand.
22   Q. You didn't speak with her in
23 connection with or while you were preparing
24 your analysis?
25   A. No, the first time I spoke to her

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K. Lu

1
2 was on January 31st which was after the
3 analysis was completed.
4   Q. Did you ever communicate with her
5 by email or any other kind of electronic
6 correspondence?
7   A. No.
8   Q. Did you take notes during your work
9 on this assignment?
10   A. No, I don't believe I took notes.
11   Q. Do you believe you were given all
12 of the information and data you needed in
13 order to perform the analysis that you were
14 asked to perform?
15   A. Yes.
16   Q. Was there any data or materials
17 that you requested, but which you did not
18 receive?
19   A. No.
20   Q. Are there any tasks that you were
21 asked to perform that you were not able to
22 complete or did not complete?
23   A. No.
24   Q. Have you been asked to do any other
25 work, perform any other investigation or do

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```
 1            K. Lu
 2  any other research on this case or related to
 3  this case beyond what you've done so far?
 4      A.  I was asked to respond to
 5  objections that were raised, I believe by pro
 6  se creditors.  I was also asked to respond to
 7  the expert report of Mr. Konstantinidis.
 8      Q.  Those are things that you've
 9  already done, is that right?
10      A.  Yes.
11      Q.  Do you intend to do any other work
12  or perform any other analysis in connection
13  with the FTX case?
14      A.  No analysis, but I believe I have
15  been asked to testify on a hearing on March
16  20th.
17      Q.  That's the hearing that relates to
18  the analysis you have already done, your
19  December 27th declaration, is that right?
20      A.  I don't know the content of that
21  hearing agenda.
22      Q.  But your testimony at that hearing
23  is in connection with the work you've already
24  performed, is that right?
25      A.  I'm sorry, can you repeat.
```

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```
 1            K. Lu
 2      Q.  Your testimony at the hearing, you
 3  expect that testimony to relate to the work
 4  you've already done for FTX?
 5      A.  Yes.
 6          MR. APPLEBAUM:  We are going to
 7  mark Exhibit 1 which is the December
 8  27th declaration.
 9          (Lu Exhibit 1, December 27, 2023
10  declaration submitted by Kevin Lu in the
11  FTX case, marked for identification.)
12      Q.  Mr. Lu, you've been handed what's
13  been marked as Exhibit 1 which is the
14  December 27, 2023 declaration that you
15  submitted in the FTX case, is that right?
16      A.  Yes.
17      Q.  You are familiar with that
18  document?
19      A.  Yes.
20      Q.  Who drafted this declaration?
21      A.  I drafted it.
22      Q.  Did anyone else help you draft it?
23      A.  Counsel at Sullivan & Cromwell
24  helped me apply the templating of a proper
25  declaration to it.
```

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```
 1            K. Lu
 2      Q.  Anyone else?
 3      A.  There were others that reviewed it,
 4  but I don't think anyone else helped me in
 5  drafting the declaration.
 6      Q.  The other data scientists at Coin
 7  Metrics that you mentioned earlier, did they
 8  draft any parts of the declaration?
 9      A.  Yes, sorry, Uriel Morone, he
10  drafted the portion on calculating the
11  confidence interval which I included in the
12  declaration.
13      Q.  How long would you say it took to
14  draft the declaration?
15      A.  In total, probably 30 hours.
16          MR. APPLEBAUM:  Go ahead and mark
17  Exhibit 2.
18          (Lu Exhibit 2, February 9, 2024
19  response to the expert report of Fotis
20  Konstantinidis, marked for
21  identification.)
22      Q.  Mr. Lu, you've been handed what has
23  been marked as Exhibit 2 which is the
24  February 9, 2024 response to the expert
25  report of Fotis Konstantinidis.
```

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```
 1            K. Lu
 2      Do you have that?
 3      A.  I have that, yes.
 4      Q.  Are you familiar with this
 5  document?
 6      A.  Yes, I am familiar.
 7      Q.  This is the responsive report that
 8  you prepared to our expert, is that right?
 9      A.  That's right.
10      Q.  Did you draft this report as well?
11      A.  Yes, I did.
12      Q.  Did anyone help you with the
13  drafting of this response?
14      A.  Uriel Morone helped me draft the
15  section C, the confidence interval is not
16  incorrectly used and that begins on paragraph
17  32.
18      Q.  Just so the record is clear, the
19  name of the heading is, quote, The Confidence
20  Interval Is Not Incorrectly Used, is that
21  correct?
22      A.  That's right.
23      Q.  So Mr. Morone drafted that section?
24      A.  He drafted an earlier version.  I
25  later heavily revised it and included it in
```

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1	K. Lu
2	the response.
3	Q. Can you describe what you mean by
4	heavily revised it?
5	A. I rewrote it in my language, I
6	added certain sections and removed certain
7	sections.
8	Q. What sections did you remove?
9	A. As I recall, he presented an
10	example of -- he presented an example where
11	the confidence interval I used would produce
12	logical results. I modified that example.
13	Q. How did you modify it?
14	MR. GLUECKSTEIN: I'm going to
15	object to this. We are giving you a lot
16	of leeway here. This is all his report
17	and work product in this case, he
18	submitted a report. He can talk about
19	his methodology, he doesn't have to talk
20	about his drafts.
21	MR. APPLEBAUM: Are you instructing
22	him not to answer?
23	MR. GLUECKSTEIN: I'm instructing
24	you not to answer, to the extent you are
25	revealing information about drafts of

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1	K. Lu
2	reports that go anything beyond your
3	analysis that's presented here.
4	Q. How long would you say it took you
5	to prepare this report?
6	A. Probably 20 hours.
7	Q. Have you prepared any other reports
8	other than the ones we have marked as
9	Exhibits 1 and 2?
10	A. No, I haven't.
11	Q. Did you communicate with anyone
12	else beyond counsel with respect to the
13	response report other than the employees at
14	Coin Metrics?
15	A. No, I haven't.
16	Q. You didn't speak with Professor
17	Howell regarding this report?
18	A. No.
19	Q. Did the attorneys at Sullivan &
20	Cromwell or Coin Metrics counsel provide
21	comments on this report?
22	A. Yes, they provided comments.
23	Q. Did you make changes to the report
24	based on those comments?
25	A. I made changes based on their

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1	K. Lu
2	comments.
3	Q. Did you form any opinions or do any
4	analysis that was not included in either of
5	your reports?
6	A. I believe I shared some of my
7	thoughts on the pro se objectors, their
8	response to my initial declaration. I shared
9	those thoughts with counsel at Sullivan &
10	Cromwell.
11	Q. Have there been any developments in
12	the case or any other information that you've
13	received after drafting the response report
14	that would alter or change the opinions or
15	positions that you've expressed in the
16	report?
17	A. No.
18	Q. If you can flip back to Exhibit 1
19	which is the original declaration. On the
20	bottom of the first page, there is a footnote
21	2 that says, Capitalized terms used, but not
22	otherwise defined herein shall have the
23	meaning set forth in the investment services
24	agreement.
25	Do you see that?

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1	K. Lu
2	A. Yes.
3	Q. What is the investment services
4	agreement?
5	A. I don't know what it is.
6	Q. Does Coin Metrics have an
7	investment services agreement with FTX?
8	A. Not to my knowledge.
9	Q. Any idea why your declaration would
10	reference an investment services agreement to
11	cross reference capitalized terms?
12	A. I believe this was suggested to me
13	by counsel at Sullivan & Cromwell to add
14	this. I don't know the meaning.
15	MR. APPLEBAUM: I would like to
16	make a request that a copy of the
17	investment services agreement be
18	provided if it wasn't produced in
19	discovery.
20	MR. GLUECKSTEIN: Noted.
21	Q. If you can flip to paragraph 9 of
22	this declaration. There is a reference here
23	to daily examination of performance of Coin
24	Metrics' prices.
25	Do you see that?

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```
1           K. Lu
2      A.  Yes.
3      Q.  What does it mean to do -- what is
4  meant by that daily examinations?
5      A.  So at 4:00 p.m. New York time,
6  every day, 365 days a year, I or other
7  members at Coin Metrics working at my
8  direction will review the Coin Metrics'
9  prices.  There is a series of automated
10  checks that we will go through such as
11  comparing our prices against third party
12  sources, checking if there is any delay in
13  the publication of any of our prices,
14  checking to see if there is any abnormal
15  volatility or jumps in the prices, checking
16  to see if a price has remained at a constant
17  level for an abnormal amount of time as well
18  as some other checks.  I or others at Coin
19  Metrics would review the output of these
20  checks every day.
21      Q.  Do you or the other Coin Metrics
22  employees make changes to the Coin Metrics'
23  prices based on that examination?
24      A.  Yes, if we detect some anomaly, it
25  can lead us to changing the constituent
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1           K. Lu
2  markets we select for a given asset.
3      Q.  Also in that paragraph, it says
4  that your responsibilities include
5  investigating and responding to price
6  challenges and questions raised by Coin
7  Metrics users.
8       Do you see that?
9      A.  Yes.
10      Q.  What is meant by responding to
11  price challenges?
12      A.  Our prices are used in a variety of
13  contexts by our users and sometimes they have
14  questions on why a certain price was at a
15  certain level.  Sometimes they are comparing
16  it against their sources and if there are
17  differences, they may ask us questions on why
18  they are observing these differences.
19      Q.  Does Coin Metrics make changes to
20  Coin Metrics' prices based on the challenges
21  or questions that may be raised by users?
22      A.  It depends on the outcome of our
23  analysis.  Sometimes we will if we determine
24  that there is -- if a change is warranted,
25  other times if we feel like there is a
```

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1           K. Lu
2  legitimate explanation and we do not make a
3  change.
4      Q.  Look at the last sentence of
5  paragraph 11.  It talks about the assignment
6  you were doing and it says that you were
7  providing pricing for 428 spot assets
8  including spot tokens and stable coins.
9       Do you see that?
10      A.  Yes.
11      Q.  What is the difference between a
12  spot token and a stable coin?
13      A.  I refer to a spot token as either a
14  native asset that is part of a block chain
15  such as Bitcoin or Ethereum or a token that
16  resides on top of a native block chain like
17  Bitcoin or Ethereum, whereas a stable coin is
18  a token that is pegged to a certain asset,
19  typically a Fiat currency like the U.S.
20  dollar.
21      Q.  In paragraph 12, you say you relied
22  -- heavily relied upon existing data products
23  and methodologies developed by Coin Metrics,
24  is that right?
25      A.  Yes.
```

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```
1           K. Lu
2      Q.  Does heavily relied mean something
3  different than exclusively relied?
4      A.  No, I believe those terms could be
5  interchangeable.
6      Q.  So you didn't rely on anything else
7  beyond the existing data products and
8  methodologies developed by Coin Metrics?
9      A.  That's right.
10      Q.  In paragraph 13, you discuss the
11  history of Coin Metrics and it states that
12  the firm has raised over $50 million in
13  multiple rounds of financing.
14       Do you see that?
15      A.  Yes.
16      Q.  It says that that financing
17  included both venture capital firms and
18  strategic investors, is that right?
19      A.  Yes.
20      Q.  Do you know who those venture
21  capital firms and strategic investors are?
22      A.  I know some of them.  I don't know
23  all of them.
24      Q.  Who are the ones that you know?
25      A.  I want to give a complete answer,
```

12 (Pages 42 to 45)

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```
1              K. Lu
2   but I'm also concerned about any kind of
3   confidential information that I may disclose.
4   I know that many of our investors are listed
5   publicly in our website and can probably be
6   found in public filings.
7   ██████████████████████████
8   █████████████████████████████████
9   █████████████████████████████████
10  ███████████████████████████████
11  ██████████████████████████████████
12  ████████████████████████████
13      Q.   Do you know if any of those
14  investors own any of the Maps, OXY or Serum
15  tokens?
16      A.   I don't know.
17      Q.   Do you know if they own any other
18  coins or tokens that were valued by Coin
19  Metrics as part of this estimation motion?
20      A.   I don't know.
21      Q.   Would you agree that providing a
22  lower value for coins or tokens not held by
23  Coin Metrics investors might result in there
24  being more assets available for recovery from
25  the FTX estate to go to holders of coins and
```

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```
1              K. Lu
2   tokens that are held by Coin Metrics
3   investors?
4       MR. GLUECKSTEIN:  Objection to
5   form.
6       A.   I really don't understand how
7   bankruptcy law works and how each party is
8   going to be remunerated.  Those thoughts
9   never really entered my mind when I was doing
10  my analysis.
11      Q.   Does Coin Metrics itself own any
12  digital assets?
13      A.   ███████████████████████████
14  ████████████████████████████.
15      Q.   Did it have any assets on the FTX
16  exchange as of the date of the bankruptcy
17  filing?
18      A.   No.
19      Q.   Does Coin Metrics hold any Maps,
20  OXY or Serum tokens?
21      A.   Not to my knowledge.
22      Q.   In paragraph 14, you talk about
23  these two different collections of prices,
24  the Coin Metrics reference rates and the Coin
25  Metrics principle markets prices.
```

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```
1              K. Lu
2       Do you see that?
3       A.   Yes.
4       Q.   What's the difference between those
5   two collections of prices?
6       A.   They use different methodologies
7   and they can be used for different
8   applications.
9           Typically, the reference rates can
10  be used for settling financial contracts or
11  serving as a benchmark for financial products
12  or for general research and backtesting
13  purposes.
14          The Coin Metrics principle market
15  prices, they are typically used for valuing
16  assets for accounting purposes.  They conform
17  to generally acceptable accounting
18  principles.
19      Q.   So the Coin Metrics reference rates
20  does not conform to GAAP principles?
21      A.   I don't know whether or not they do
22  because I'm not an accountant, but I know
23  that some of our users have preferred using
24  the principle market prices for that purpose.
25      Q.   What goes into the underlying
```

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```
1              K. Lu
2   methodology of the Coin Metrics reference
3   rates?
4       A.   At a very high level, there are two
5   components in the methodology, one component
6   is selecting a set of high quality
7   constituent markets used in the calculation
8   of the price and the second component and
9   methodology is the actual statistical
10  techniques that we apply to calculate the
11  price.
12      Q.   In paragraph 15, you say that the
13  Coin Metrics' prices have become, and I
14  quote, widely used within the industry, is
15  that right?
16      A.   That's right.
17      Q.   How does Coin Metrics track the use
18  of Coin Metrics' prices?
19      A.   We can observe how our users are
20  using it.  We observe how our prices are --
21  serve as benchmarks of financial products
22  which are reported in publicly filed
23  documents.  We can observe how our prices are
24  published on chain through block chain
25  oracles and we observe just the sheer number
```

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```
 1              K. Lu
 2   of users who are subscribed to this
 3   commercial data product.
 4       Q.  What level of use of Coin Metrics'
 5   prices supports being described as widely
 6   used within the industry?
 7       A.  I would say the number of users and
 8   the profile, the importance of those users,
 9   the footprint of those users.
10       Q.  Does Coin Metrics track that with
11   some kind of a document that logs how many
12   times it's being referenced and cited in
13   those different sources you just mentioned?
14       A.  We have logging for our API which
15   is the primary mechanism for how our users
16   get our data so we can see how many times our
17   users are requesting that data.
18       Q.  In paragraph 20, there is a
19   reference to a 2021 Bitwise investment
20   advisors analysis that says that Bitwise
21   relied on Coin Metrics.  It says they were
22   looking for three types of errors and that
23   Coin Metrics had zero errors, whereas its
24   competitors had between 2 and 4,929 errors.
25       Do you see that?
```

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```
 1              K. Lu
 2       A.  Yes, I see that.
 3       MR. APPLEBAUM:  I will mark Exhibit
 4   3.
 5       (Lu Exhibit 3, document dated June
 6   11, 2021 by Matthew Hougan, Hong Kim and
 7   Satyajeet Pal of Bitwise Asset
 8   Management, marked for identification.)
 9       Q.  You've been handed what's been
10   marked as Exhibit 3 which is a document dated
11   June 11, 2021 by Matthew Hougan, Hong Kim and
12   Satyajeet Pal of Bitwise Asset Management.
13       Do you see that?
14       A.  Yes.
15       Q.  Is that the 2021 Bitwise analysis
16   you were referring to in paragraph 20 of your
17   declaration and the quoted section is on page
18   142 of 269 of the pages at the top?
19       A.  Yes, it is.
20       Q.  Is it your opinion that Coin
21   Metrics coverage of these exchanges has no
22   errors?
23       A.  No, that's not my opinion.
24       Q.  Why not?
25       A.  As I say in my declaration,
```

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```
 1              K. Lu
 2   collecting data from cryptocurrency exchanges
 3   is an engineering task of high complexity,
 4   you basically need to have systems running
 5   24/7 uninterrupted every day of the year and
 6   if there are any interruptions in the
 7   collection, it can lead to a persistent void
 8   in the data provider's dataset.
 9       I would say that every data
10   provider has a certain degree of data quality
11   issues, it's almost impossible not to have
12   them, but I think the evidence shows that the
13   data quality at Coin Metrics is at a level
14   higher than other data providers.
15       MR. TOROSIAN:  Can you both speak
16   up a bit, it's hard to hear with
17   everyone going to the Hamptons outside.
18       Q.  There is a reference here -- in
19   this paragraph, it's comparing Coin Metrics
20   with, quote, its competitors.
21       Do you see that?
22       A.  Yes.
23       Q.  Do you know who were the
24   competitors that Bitwise comparing against
25   Coin Metrics?
```

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```
 1              K. Lu
 2       A.  No, I don't know the specific
 3   competitors.
 4       Q.  And from our review, it looks like
 5   this article was only looking at Bitcoin
 6   prices, is that right?
 7       A.  Yes.
 8       Q.  Do you know if Bitwise examined
 9   data relating to any other cryptocurrency or
10   digital assets?
11       A.  Sorry, I would like to modify my
12   previous response.
13       Q.  Okay.
14       A.  I don't know the exact dataset that
15   they examined.  They say -- they raise as an
16   example the Bitcoin USD market, but they may
17   have examined other markets.
18       Q.  In that same paragraph, it says
19   that they looked at LBank and Coin Base as
20   crypto exchanges for Bitcoin?
21       A.  Right.
22       Q.  Is LBank a reliable exchange?
23       A.  In my opinion, it's not a reliable
24   exchange.  In fact, I believe it ranks last,
25   dead last in our trusted exchange framework.
```

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```
1           K. Lu
2      Q.  So do you believe it was
3  inappropriate for Bitwise to use that as its
4  -- for purposes of its analysis in this
5  article?
6      A.  I can't speak as to whether or not
7  it's appropriate for their analysis.
8      Q.  Why can't you speak to that?
9      A.  I personally haven't reviewed the
10 literature on how to perform this lead lag
11 analysis that Bitwise performed.  I would
12 need to do a thorough review of this topic
13 and a thorough analysis of the data before I
14 could determine whether or not LBank is
15 suitable -- is a suitable exchange.
16     Q.  But this is a document, a paper
17 that you relied on and referenced as part of
18 your declaration, is that right?
19     A.  That's right.
20     Q.  Do you know if any of the authors
21 of this article, this paper, have invested in
22 Coin Metrics?
23     A.  No, not to my knowledge.
24     Q.  Do you know if Bitwise has invested
25 in Coin Metrics?
```

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```
1           K. Lu
2      A.  No, not to my knowledge.
3         (Lu Exhibit 4, Bitwise document
4  called Crypto Use Cases:  12 Real World
5  Stores of How Millions of People Are
6  Using Crypto Services Today, marked for
7  identification.)
8      Q.  Mr. Lu, I've handed you what we
9  have marked as Exhibit 4 which is another
10 Bitwise document called Crypto Use Cases:  12
11 Real World Stores of How Millions of People
12 Are Using Crypto Services Today.
13         Do you see that?
14     A.  Yes.
15     Q.  At the bottom of the front page, it
16 says that was from April 2023.
17         Do you see that?
18     A.  Yes.
19     Q.  Are you familiar with this article?
20     A.  No, I believe this is the first
21 time I'm seeing it.
22     Q.  If you look at page 8 of this
23 article, there is a section here talking
24 about stable coins.  The title is Stable
25 Coins Moving Dollars At the Speed of the
```

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```
1           K. Lu
2  Internet and on page 8, there is a chart that
3  says at the bottom, Value of stable coin
4  transfers in U.S. dollars, trillions.
5         Do you see that?
6      A.  Yes.
7      Q.  It says that the source is Bitwise
8  Asset Management with data from Coin Metrics
9  and Coin Getko as of March 31, 2023, is that
10 right?
11     A.  Yes.
12     Q.  Then if we look at page 14, in
13 another one of these cases, there is another
14 chart called Union Swap Versus Coin Business
15 Relative Share Trading Volume.
16         Do you see that?
17     A.  Yes.
18     Q.  It says they are the source for
19 that chart is Bitwise Asset management with
20 data from the block and Coin Getko as of
21 March 31, 2023, is that right?
22     A.  That's right.
23     Q.  Does this mean that Coin Getko has
24 a high quality of data, is that why Bitwise
25 is relying on it?
```

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```
1           K. Lu
2         MR. GLUECKSTEIN:  Objection to
3     form.
4      A.  I really don't know why they chose
5  these specific data sources.  I was not part
6  of creating this document.
7      Q.  But you generally rely on articles
8  and publications from Bitwise in support of
9  your declaration, is that right?
10     A.  I've cited two papers from Bitwise
11 in my declaration and response.
12     Q.  You can flip back to your original
13 declaration which is Exhibit 1.
14         If we turn to paragraph 28, this is
15 where you start your methodology discussion.
16         Do you see that?
17     A.  Yes.
18     Q.  Again, here we have the words,
19 relied heavily.
20         Is that the same as the other
21 instance where that should be read as relied
22 exclusively or did you rely on other things
23 as well?
24     A.  No, it can be read as relied
25 exclusively.
```

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```
 1           K. Lu
 2      Q.  It says that you have used -- the
 3  methodology that you used in this assignment
 4  is generally identical to the methodology
 5  used to generate the Coin Metrics' prices
 6  with minor adjustments, is that right?
 7      A.  That's right.
 8      Q.  What were the minor adjustments
 9  necessary to price FTX digital assets?
10      A.  In this case, I created a hierarchy
11  of exchanges where I first preferred to use
12  exchanges that are considered trusted by the
13  trusted exchange framework and if a given
14  asset is not traded on those exchanges, then
15  I would then consider exchanges that are not
16  trusted and if a given asset is not traded on
17  either of the trusted exchanges or not
18  trusted exchanges, then I would consider
19  using the FTX exchanges and that is the
20  primary way that this methodology differs
21  from the Coin Metrics' prices.  The Coin
22  Metrics' prices does not have this hierarchy
23  of selection.
24      Q.  How is Coin Metrics different, what
25  does it use instead of that hierarchy?
```

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```
 1           K. Lu
 2      A.  It will consider all the candidate
 3  markets from all exchanges, but the
 4  methodology and logic used to select the
 5  constituent markets is identical between what
 6  I used in the declaration and the Coin
 7  Metrics' prices.
 8      Q.  So Coin Metrics' prices starts with
 9  all of the exchanges and the methodology that
10  is used here only started with the trusted
11  exchanges if they were available?
12      A.  That's right.
13      Q.  In the next paragraph, paragraph
14  29, about halfway down, the middle of the
15  paragraph on that same page it says, It is
16  widely recognized within the industry that
17  some exchanges engage in wash trading or
18  other deceptive means to inflate their
19  reported trading activity.
20         Do you see that?
21      A.  That's right, I see it.
22      Q.  What information did you have to
23  support your statement that that conduct is
24  wildly recognized within the industry?
25      A.  I reviewed the paper published by
```

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 1           K. Lu
 2  Bitwise in 2019 where they revealed that
 3  there was a great deal of wash trade that
 4  occurs in the industry.  I saw firsthand how
 5  the industry responded to this finding.
 6         I've reviewed the academic
 7  literature of other researchers that have
 8  studied this same topic and just by the fact
 9  of working full-time in the industry for the
10  past five years and regularly interacting
11  with other folks that work within the
12  industry, it's my opinion that most
13  sophisticated practitioners understand that
14  this is occurring.
15      Q.  You say you saw how the industry
16  responded to the 2019 Bitwise article, is
17  that right?
18      A.  Yes.
19      Q.  And how did the industry respond?
20      A.  There was a large amount of media
21  attention.  I believe data providers and
22  practitioners within the industry either
23  published research or made changes in
24  response to the finding.
25      Q.  What changes did practitioners make
```

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 1           K. Lu
 2  in response to the findings?
 3      A.  One example that comes to mind is
 4  that Bitwise identified in their view, 10
 5  exchanges that had, quote/unquote, real
 6  trading volume and in response to that, I
 7  believe that Nasari, which is a media company
 8  and data company within the cryptocurrency
 9  industry, they started publishing the
10  reported volume for just these 10 exchanges
11  on their website.
12      Q.  Any other changes in the industry
13  that you are aware of as a result of the 2019
14  article?
15      A.  I believe Coin Market Cap made some
16  changes because they were severely criticized
17  in the Bitwise report.
18      Q.  Are you aware of other exchanges
19  that took corrective action to address the
20  problems that were identified in the 2019
21  article?
22      A.  I don't know the specific actions
23  that exchanges took.
24      Q.  But you are aware that many of the
25  exchanges at least claim to have implemented
```

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```
 1              K. Lu
 2   corrective changes as a result of the
 3   findings of the 2019 article, is that right?
 4       A.   I don't know if they've made
 5   changes or not.
 6       Q.   Part of your analysis and part of
 7   the assignment is this calculation of a
 8   confidence interval, is that right?
 9       A.   Yes.
10       Q.   And that's supposed to reflect the
11   uncertainty in the determination of a price
12   of an asset, is that right?
13       A.   Right.
14       Q.   Do you know what the definition of
15   confidence interval is for purposes of
16   statistics?
17       A.   Yes.
18       Q.   What is that?
19       A.   Typically, a confidence interval is
20   reported with a certain magnitude such as for
21   a certain level such as the confidence
22   interval at the 95 percent level and that
23   means that for a given statistic, the value
24   of that statistic would fall within that
25   range of 95 percent of the samples drawn from
```

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```
 1              K. Lu
 2   a hypothetical population.
 3       Q.   So your understanding is that in
 4   statistics, it is typical for a confidence
 5   interval to be pegged to a certain percentage
 6   of value like the 95 percentile?
 7       A.   Yes, it can be reported at any
 8   arbitrary level, but typically, 95 percentile
 9   is used.
10       Q.   What source do you rely on for your
11   determination that typically, the 95
12   percentile is used?
13       A.   It's based on my studies of
14   statistics at -- during my undergrad studies,
15   it's based on other reports that I've
16   encountered during my professional
17   experience.  I have found that 95th
18   percentile seems to be an industry standard,
19   if you will, that people tend to use.
20       Q.   What courses at Berkeley did you
21   take in statistics?
22       A.   I took statistics courses, I can't
23   recall the exact names, but they were a
24   requirement for my economics degree.
25       Q.   What's the basis for your opinion
```

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```
 1              K. Lu
 2   that using the 95th percentile for purposes
 3   of calculating a confidence interval is
 4   industry standard?
 5       A.   From reviewing other reports and
 6   papers on a variety of topics.
 7       Q.   And to be clear, when you say
 8   industry standard, what industry are you
 9   referring to?
10       A.   It goes beyond the cryptocurrency
11   industry.  This seems to be a standard that's
12   applied to a variety of contexts.
13       Q.   Would you agree that the term
14   confidence interval is intended to express
15   the level of uncertainty when inferring from
16   a sample to a larger population?
17       A.   I think that's one possible
18   interpretation, but there are other
19   interpretations that are equally valid.
20       Q.   Is that an accurate interpretation
21   for how you are using the term confidence
22   interval in your declaration?
23       A.   My interpretation of my assignment
24   was to produce a number that reflected the
25   uncertainty of my determination of the price
```

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 1              K. Lu
 2   and I chose the specific methodology I used
 3   to calculate this number to fulfill my
 4   assignment.
 5       Q.   Would you agree though that your
 6   pricing methodology including by excluding
 7   certain exchanges is taking a sample and then
 8   extrapolating that to determine the value for
 9   the population more broadly?
10           MR. GLUECKSTEIN:  Objection to
11       form.
12       A.   No, I do not consider that a sample
13   because usually when you refer to a sample,
14   you are usually referring to a random sample
15   where you are sampling without any bias.
16           My methodology involved selecting
17   the highest quality constituent market.
18   These are markets that are unlikely to engage
19   in wash trading, have large volume, are
20   unlikely to have outliers so I would not
21   consider this a sample of the population.
22       Q.   If you look at your rebuttal report
23   which is Exhibit 2, in paragraph 34, you
24   discuss three examples where you say that a
25   confidence interval calculated using the
```

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 1            K. Lu
 2   standard method in statistics would lead to
 3   unintuitive results.
 4       Do you see that?
 5       A.  Yes.
 6       Q.  Are the three examples that you
 7   provide, were those taken from any
 8   statistical textbooks or other academic
 9   authority?
10       A.  No.
11       Q.  Did you derive those three examples
12   from any of the statistics courses you took
13   at Berkeley or any other courses you have
14   taken on statistics?
15       A.  No.
16       Q.  Is the 95th percentile the same as
17   the 95th percent interval in statistics?
18       A.  I don't know.  I'm not sure if I
19   understand your question.
20       Q.  Are you generally familiar with
21   Professor Howell's work and analysis in this
22   case?
23       A.  I wouldn't say I'm generally
24   familiar.  I read a portion of her expert
25   report.  The portion that was relevant to the
```

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 1            K. Lu
 2   sections of Mr. Konstantinidis' report that
 3   criticized both my initial declaration and
 4   Professor Howell's report.
 5       MR. TOROSIAN:  Can we maybe take
 6   five minutes.
 7       MR. APPLEBAUM:  We will take a
 8   five-minute break.
 9       (Recess.)
10       Q.  Mr. Lu, one of the questions I
11   asked you a moment ago was about comparing
12   the 95th percentile to the 95 percent
13   interval.
14       If I reask that and ask is the 95th
15   percentile the same as the 95 percent
16   confidence interval, is that the same thing?
17       MR. GLUECKSTEIN:  Objection to
18   form.
19       A.  I'm not sure.  The 95th percentile
20   is just an abstract term.  I don't know if
21   they're the same thing.
22       Q.  How does the term -- how does the
23   95 percent confidence interval compare to a
24   margin of error?
25       A.  Typically, in my experience, the
```

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 1            K. Lu
 2   margin of error is just an alternative term
 3   for the confidence interval and typically,
 4   the margin of error will be reported at,
 5   again, arbitrary level like 95 -- like at the
 6   95th percentile.
 7       Q.  I just asked you a little bit about
 8   your familiarity with Professor Howell's
 9   analysis.
10       You are aware that she used your
11   analysis and the numbers you reported as part
12   of her analysis, is that right?
13       A.  I believe she used the prices that
14   I calculated, yes.
15       Q.  Do you believe that -- do you
16   understand that her work was affected in any
17   way by the specific confidence interval for
18   any particular digital asset?
19       MR. GLUECKSTEIN:  Objection to
20   form.
21       A.  I'm not familiar with the specific
22   analyses that Professor Howell did, but my
23   understanding was that the confidence
24   interval was not an input that she used.
25       Q.  What's your understanding as to the
```

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 1            K. Lu
 2   purpose of your calculating the confidence
 3   interval?
 4       A.  I really don't know, except that it
 5   was specifically asked for as part of the
 6   scope of my work.
 7       Q.  So one of the things that you say
 8   in your declaration is that the purpose is to
 9   estimate a range within which you think the
10   true price will fall, is that right?
11       A.  Yes.
12       Q.  So does that mean that there is a
13   true price, but that you are not able to
14   calculate that with precision?
15       A.  I think there is a true price, that
16   would be the price that is the output of
17   applying my methodology to the data.
18       Q.  Are you done?
19       A.  Yes.
20       Q.  So if applying the methodology to
21   the data creates the true price, why is the
22   confidence interval not zero for every
23   digital asset?
24       A.  The confidence interval just
25   reflects the uncertainty that I may have in
```

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 1            K. Lu
 2  calculating the true price.
 3         For instance, if for a given asset,
 4  it is extremely volatile during the time
 5  period immediately prior to the petition
 6  time, that may cause my uncertainty to rise
 7  in my determination of the price.
 8      Q.   So your methodology creates the
 9  true price, but you are uncertain as to
10  whether it's accurate?
11      A.   I wouldn't say that I'm uncertain
12  that it's accurate.  The confidence interval
13  more or less represents how volatile the
14  asset was immediately prior to the petition
15  time.
16      Q.   So if the asset is volatile prior
17  to the petition time, you are less certain
18  that the price you've given is the true
19  price?
20      A.   No, I'm still certain that the
21  price I've given is the true price as I've
22  applied my methodology.  It's just that, say,
23  one second prior to the petition time or one
24  minute prior to the petition time, the asset
25  may have a different price.
```

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 1            K. Lu
 2      Q.   Part of your calculation of the
 3  confidence interval is the use of this
 4  formula that is described as the root means
 5  squared difference, is that right?
 6      A.   Yes.
 7      Q.   You use the initial RMSD for that?
 8      A.   Yes.
 9      Q.   Did you create that formula?
10      A.   Yes, I created this formula.
11      Q.   What expertise do you have in
12  creating formulas to measure confidence
13  intervals?
14      A.   I created -- I would like to
15  provide a little more context to my prior
16  response.
17      Q.   Okay.
18      A.   I created this formula, but the
19  concept of a root mean squared deviation is
20  an established idea within statistics, it's
21  commonly used in other contexts.
22         I created the formula based on my
23  experience from working within the industry
24  for the past five years and from my general
25  experience of applying data science to
```

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 1            K. Lu
 2  financial data for the past 15 years.
 3      Q.   Did you create this formula
 4  specifically for this assignment or is this a
 5  formula that you've used in other parts of
 6  your work in the last number of years?
 7      A.   This was created specifically for
 8  this assignment.
 9      Q.   You, in addition to creating the
10  formula, you also decided what inputs would
11  be used to go into the formula, is that
12  right?
13      A.   Yes.
14      Q.   So for example, it says that you
15  filtered out digital assets which had 10
16  trades or less and $100 or less in U.S.
17  dollar trade volume during the 10-minute
18  period, is that right?
19      A.   That's right.
20      Q.   So you decided to apply those
21  filters for this formula, is that right?
22      A.   Yes, I did.
23      Q.   Is there any published or
24  nonpublished article saying that those are
25  the appropriate filters when calculating a
```

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```
 1            K. Lu
 2  confidence interval?
 3      A.   Not to my knowledge.
 4      Q.   You also weigh the trades by the
 5  average U.S. dollar volume, is that right?
 6      A.   Yes.
 7      Q.   And that was your determination to
 8  do that, that that was the appropriate way to
 9  weigh trades, is that right?
10      A.   Yes.
11      Q.   Again, there is no published peer
12  reviewed article saying that's the right way
13  to weigh trades, is that right?
14      A.   I would say that it's common form
15  when applying statistical techniques to
16  financial data to weigh things by trade
17  volume because it gives more weight to
18  observations where there was higher volume.
19      Q.   So you said it's common to weigh by
20  trade volume.  Did I repeat that right?
21      A.   Yes, it's common to weigh by trade
22  volume in a variety of contexts.
23      Q.   And what's the basis for your
24  belief that that is common to do that?
25      A.   I have reviewed pricing
```

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1	K. Lu
2	methodologies from many sources, from
3	well-established data providers both within
4	the cryptocurrency industry and in the
5	traditional financial services industry and I
6	observed that weighing by trade volume is a
7	very common thing that occurs in these
8	methodologies.
9	Q. You don't cite any of those sources
10	in your declaration, is that right?
11	A. No, I don't.
12	Q. Can you identify any of those
13	sources as you are sitting here today, by
14	name?
15	A. I believe the CMECF benchmarks
16	methodology weighs by trade volume in the
17	calculation of their price.
18	Q. In your response report and I think
19	earlier today you also mentioned the 2019
20	Bitwise article that talks about Coin Market
21	Cap and the amount of fake volume or wash
22	trading, is that right?
23	A. Yes.
24	MR. APPLEBAUM: We are going to
25	mark what is Exhibit 5.

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1	K. Lu
2	(Lu Exhibit 5, document called
3	Economic and Noneconomic Trading in
4	Bitcoin Exploring the Real Spot Markets
5	For the World's First Digital Commodity,
6	marked for identification.)
7	Q. You've been handed what's been
8	marked as Exhibit 5 which is a document
9	called Economic and Noneconomic Trading in
10	Bitcoin Exploring the Real Spot Markets For
11	the World's First Digital Commodity.
12	Do you see that?
13	A. Yes.
14	Q. That was written in May 24, 2019,
15	is that right?
16	A. That's right.
17	Q. That's more than three years before
18	the petition date, right?
19	A. Yes.
20	Q. Where was this article published?
21	A. I believe it was published on
22	Bitwise's website, but it was also submitted
23	as part of Bitwise's application to the SEC
24	for their exchange traded funds so I believe
25	it's also published on the SEC's website.

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1	K. Lu
2	Q. Do you know if it was carried in
3	any academic journals?
4	A. I don't know if it's been published
5	in any journals.
6	Q. Do you know if it was peer
7	reviewed?
8	A. I don't know if it's been peer
9	reviewed.
10	Q. Are you familiar with any of the
11	authors, Matthew Hogan, Hong Kim or Michael
12	Lerner?
13	A. I am generally familiar with
14	Matthew Hogan just as a public figure. The
15	other two individuals, I don't know.
16	Q. What's your familiarity with Mr.
17	Hogan?
18	A. I believe he is the CEO of Bitwise
19	Asset Management if I'm not mistaken. That's
20	kind of the extent of my knowledge of him.
21	Q. Do you know if any of these authors
22	are established experts, if they have ever
23	been qualified as an expert in any court?
24	MR. GLUECKSTEIN: Objection, calls
25	for a legal conclusion.

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1	K. Lu
2	A. I don't know the qualifications of
3	those individuals.
4	Q. Just looking at the abstract on
5	page 1 and the title, this article was
6	focused solely on the Bitcoin market, is that
7	right?
8	A. Yes.
9	Q. And the article doesn't say
10	anything about either the Maps tokens, the
11	OXY tokens or the Serum tokens, does it?
12	A. It does not.
13	Q. What sources have you reviewed that
14	identify the existence of wash trading with
15	respect to Maps tokens?
16	A. I personally haven't examined the
17	specific exchanges that those tokens were
18	traded on so I don't know the extent to which
19	wash trading occurred for those tokens on
20	those exchanges.
21	Q. Are you aware of any data that
22	indicates that there was any wash trading
23	with respect to Maps tokens?
24	A. I haven't looked at the data so I
25	don't know one way or the other if there is

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	K. Lu
1	K. Lu
2	wash trading or not.
3	Q. Have you reviewed any sources that
4	identified wash trading for OXY tokens?
5	A. No. Same answer as Maps.
6	Q. Is it the same answer for Serum
7	tokens as well?
8	A. Yes.
9	Q. So you are not aware of any data or
10	research or articles that identify that there
11	has been any wash trading for Maps, OXY or
12	Serum tokens?
13	A. I personally haven't looked into
14	the topics, I don't know if there exists any
15	of that data reports, I have not personally
16	reviewed those.
17	Q. None of the studies that you cite
18	either in your original declaration or your
19	response report, none of those studies
20	discuss wash trading or fake volume with
21	respect to Maps, OXY or Serum tokens, is that
22	right?
23	A. The Bitwise paper examined Bitcoin.
24	I also cited some other academic papers in my
25	response and I can't recall the exact tokens

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	K. Lu
1	K. Lu
2	or sample of data they used in their
3	analysis, so I don't know if they included
4	the tokens in your question or not.
5	Q. So as you are sitting here today,
6	you don't recall if any of those sources
7	discussed Maps, OXY or Serum tokens?
8	A. I know the Bitwise paper does not,
9	I don't know if those academic papers I cited
10	do or do not.
11	Q. Does the Bitwise paper discuss Coin
12	Getko?
13	A. Their primary data sample was
14	collected from Coin Market Cap, but they
15	specifically state that their observation can
16	be applied to other data aggregators in the
17	space.
18	Q. But they don't mention Coin Getko
19	by name, right?
20	A. They do not mention Coin Getko by
21	name.
22	Q. They don't mention Coin Paprika by
23	name either?
24	A. No, they don't.
25	Q. In your rebuttal report, you say

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	K. Lu
1	K. Lu
2	that serious practitioners within the
3	industry understand that data aggregators
4	such as Coin Market Cap, Coin Getko and Coin
5	Paprika are not reliable sources for trading
6	volume data, is that right?
7	A. Yes.
8	Q. Are you aware those data
9	aggregators were used by the parties and
10	accepted by the Bankruptcy Court in the
11	Celsius bankruptcy case?
12	A. I am not aware of that. I haven't
13	reviewed any documents relating to the
14	Celsius bankruptcy case.
15	Q. Are you aware that Professor Howell
16	in her analysis used Coin Market Cap for the
17	at least 44 additional assets?
18	A. I recall reading that in her
19	report, yes.
20	Q. Is it your belief then that
21	Professor Howell is not a serious
22	practitioner within the industry?
23	A. No. That's not my -- that would
24	not lead me to make that conclusion.
25	Q. Why not?

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	K. Lu
1	K. Lu
2	A. Again, I was not involved with
3	analysis that Professor Howell conducted, but
4	my understanding was that she relied on Coin
5	Market Cap because there was insufficient
6	data from the data provided by Coin Metrics
7	and I think it's reasonable to use
8	alternative sources when your primary dataset
9	does not cover -- I guess does not cover some
10	of the assets in your analysis.
11	Q. So Professor Howell was forced to
12	you use an unreliable data source in your
13	opinion because Coin Metrics data source was
14	incomplete or inadequate?
15	MR. GLUECKSTEIN: Objection to
16	form.
17	A. I really don't know why she chose
18	to use Coin Market Cap, but my understanding
19	is that if she did use Coin Market Cap's
20	volumes, that would represent a conservative
21	assumption on her behalf because, as I said
22	before, I believe that Coin Market Cap
23	overreports the economic, the true economic
24	volume for a different asset.
25	Q. Would you agree that an asset, a

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1	K. Lu
2	digital asset or otherwise, is worth what
3	someone is willing and able to pay for it?
4	A. Yes, I think the market price of an
5	asset represents the current price of an
6	asset.
7	Q. So even if the volume on a
8	particular exchange may be inflated, if I'm
9	able to go and sell a token on that exchange
10	and someone pays a certain price, that's the
11	value that I received for that asset, isn't
12	that right?
13	A. Yes, if someone is able to sell an
14	asset at that price, then as long as the
15	transaction is between a willing buyer and a
16	willing seller engaged in an arm's length
17	transaction, I would consider the price
18	resulting from that transaction to be an
19	accurate reflection of the market price of
20	that token.
21	Q. And even if there are examples of
22	wash trading on a particular exchange, it's
23	not your belief that every trade on a
24	particular exchange is fake or wash trading,
25	is that right?

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1	K. Lu
2	A. It's possible that there are some
3	transactions that are economic in nature,
4	yes.
5	Q. Would including more crypto
6	exchanges effect the price that you've
7	calculated for any particular digital asset?
8	A. It could effect the price, yes.
9	Q. It could or it would?
10	A. Without doing the actual
11	calculations, I can't say for sure, but if
12	you generally change the constituents used in
13	the calculation, it can result in a different
14	output.
15	Q. Take a look at your rebuttal report
16	which was Exhibit 2. Go to page 7 which is
17	the carry over. It starts with the carry
18	over paragraph which is the second part of
19	paragraph 13.
20	Do you see that?
21	A. Yes.
22	Q. And the first full sentence on that
23	page says, Coin Metrics users represent
24	active market participants and practitioners
25	within the industry and independently

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1	K. Lu
2	determine the exchanges that they interact
3	with and require data from steering clear of
4	obscure exchanges that may artificially
5	inflate reporting trading activity.
6	A. Yes.
7	Q. Over time, this has resulted in a
8	carefully curated exchange covered universe
9	maintained by Coin Metrics, shaped by the
10	collective consensus of active market
11	participants.
12	Did I read that right?
13	A. Yes.
14	Q. Does that mean that Coin Metrics
15	uses market participants to curate the
16	exchanges that it uses and to determine which
17	are the most trusted exchanges?
18	A. We use user feedback to determine
19	which exchanges we collect market data from,
20	but the actual methodology that governs our
21	trusted exchange framework and governs our
22	Coin Metrics' prices is completely determined
23	independently by Coin Metrics. We will
24	independently assess the quality of those
25	exchanges and independently determine which

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1	K. Lu
2	exchanges are trusted exchanges or which
3	exchanges should serve as constituents in our
4	prices.
5	Q. So is the determination of which
6	exchanges are trusted exchanges, is that
7	entirely an independent analysis by Coin
8	Metrics or do you factor in user feedback?
9	A. It's entirely independently
10	assessed by Coin Metrics. We do not factor
11	in user feedback.
12	Q. So how do you use the user feedback
13	in the process then?
14	A. We use user feedbacks to determine
15	which exchanges we will collect data from to
16	begin with and those exchanges are part of
17	another commercial data product called our
18	market data feed which basically provides raw
19	data from a variety of exchanges.
20	Q. So I want to make sure I
21	understand.
22	Your only -- you're employing an
23	independent analysis, but you are only
24	starting with a dataset that is informed by
25	the user feedback?

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 1         K. Lu
 2         MR. GLUECKSTEIN:  Objection,
 3    misstates testimony.
 4    Q.  You can answer.
 5    A.  I think the starting universe is,
 6  in part, shaped by user feedback, but not
 7  exclusively shamed by user feedback.  We will
 8  also make an independent assessment on
 9  whether or not to cover an exchange and there
10  are instances where a user may request an
11  exchange, but we decide not to cover an
12  exchange.
13    Q.  Does Coin Metrics use any AI,
14  artificial intelligence, algorithms or data
15  analysis tools to determine which exchanges
16  it looks at?
17    A.  No, we do not use AI in this
18  manner.
19    Q.  In paragraph 16 of your rebuttal
20  report, you suggest that you don't see a
21  problem in not selecting all trade exchanges
22  where a digital asset is traded to determine
23  price, is that right?
24    A.  Yes.
25    Q.  Is that a widely accepted method in
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 1         K. Lu
 2  data platforms for price calculation?
 3    A.  Yes.  There are other methodologies
 4  that I can cite where other data providers or
 5  index administrators have similarly applied
 6  their own methodology in selecting which
 7  constituent exchanges or markets they feel
 8  should serve as constituents in their indexes
 9  or prices.  So what we are doing is pretty
10  much conforming to the industry standard.
11    Q.  And which other platforms are you
12  familiar with that employ this process of
13  ignoring certain exchanges?
14    A.  I believe the CMECF benchmarks, I
15  believe the Kaiko reference rates and I
16  believe there are others, but I can't recall
17  off the top of my head right now.
18    Q.  Those two that you mentioned, CMECF
19  and Kaiko, do those employ a similar
20  methodology to the trusted framework that
21  Coin Metrics uses to determine which
22  exchanges they will include?
23    A.  Conceptually, it's very similar,
24  each data provider will make their own
25  assessment of the quality of an exchange.
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 1         K. Lu
 2  The specific tests and analysis that they
 3  perform can be different.
 4    Q.  In paragraph 18 of your rebuttal
 5  report, you state that, and I quote, For the
 6  purpose of calculating prices, the
 7  methodology does not require a comprehensive
 8  accounting of all global trade volume as long
 9  as the selected exchanges carry a significant
10  portion of volume and are determined to have
11  trustworthy and liquid operations, including
12  more exchanges, would not improve the quality
13  of the calculated price, is that right?
14    A.  Yes.
15    Q.  What is the threshold amount that's
16  necessary to achieve a, quote, significant
17  portion of volume, closed quote?
18    A.  I determined that by applying the
19  logic to select constituent markets that I
20  described in my initial declaration.  I
21  believe that we select -- so that methodology
22  will rank the candidate markets along variety
23  of dimensions and will select the top six of
24  those candidate markets to serve as the
25  constituent markets that serve as inputs into
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 1         K. Lu
 2  my calculation.
 3         I will also select any candidate
 4  market ranked within the top 10 if its volume
 5  market share exceeds 20 percent I believe,
 6  and that is described in my initial
 7  declaration.
 8    Q.  With respect to the Maps tokens,
 9  the only exchange you ultimately used was the
10  Gate.io exchange?
11    A.  Yes, I believe so.
12    Q.  Do you know what volume of Maps
13  tokens existed on either the FTX or MexC
14  exchanged compared to Gate.io?
15    A.  I can't recall as I sit here, I
16  would have to look at the data.
17    Q.  Similarly for -- strike that.
18         Would your answer be the same with
19  respect to OXY tokens and the relative
20  volumes between FTX, MexC and Kraken on the
21  one hand, compared to Gate.io and Bitfinex
22  which were the two you selected?
23    A.  Yes, I would have to look at the
24  data.
25    Q.  In your original declaration, the
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K. Lu

1
2   one from December, you discuss the Coin
3   Metrics trusted exchange framework and you
4   talked a little about that today?
5   A.   Yes.
6   Q.   Who developed the trusted exchange
7   framework?
8   A.   It was jointly developed by several
9   individuals at Coin Metrics.
10   I believe that the first page shows
11   the authorship, that there were four
12   individuals I believe that were involved.
13   Q.   And in paragraph 36 of your
14   declaration, you refer to a -- you said that
15   it was developed after a comprehensive
16   literature review?
17   A.   Yes.
18   Q.   Do you know what literature was
19   reviewed to prepare the trusted exchange
20   framework?
21   A.   There were several papers and
22   documents and analyses that we reviewed. I
23   can't recall them all, but certainly we
24   reviewed the 2019 Bitwise paper, we reviewed
25   a paper published by Fidelity which examined

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K. Lu

1
2   the lead lag relationship between exchanges.
3   We reviewed some of the academic literature.
4   Some of those papers were cited in my
5   response and we reviewed other analyses that
6   were published by other parties that studied
7   the same problem.
8   Q.   Who at Coin Metrics was responsible
9   for identifying what literature would be
10   reviewed in creating the trusted exchange
11   framework?
12   A.   I don't know if there was one
13   single individual who was responsible for
14   deciding what would be viewed or not. Many
15   people did their own independent review and
16   we collectively -- that collectively informed
17   our opinions.
18   Q.   Did Coin Metrics do anything to
19   independently verify the sources and
20   materials that were referenced in that
21   literature that was reviewed?
22   A.   Can you explain more by
23   independently verified?
24   Q.   Sure. So, for example, the 2019
25   Bitwise article talks about findings that

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K. Lu

1
2   Bitwise made regarding wash trading and fake
3   trading on a variety of exchanges, is that
4   right?
5   A.   Yes.
6   Q.   Did Coin Metrics, as part of its
7   reliance on the 2019 Bitwise article, go in
8   and double check the data that Bitwise had
9   relied on in reaching those conclusions?
10   A.   We didn't double check their exact
11   analysis, but their analysis -- we have taken
12   several of their specific analyses and
13   applied it to our own sample of data and
14   reached similar conclusions to Bitwise and
15   other researchers.
16   Q.   How did you do that?
17   A.   It's described in the trusted
18   exchange framework, but we took a sample of
19   data, I believe from 2022 Q3 to 2023 Q3 and
20   we applied a number of statistical tests on
21   the data to test for, among other things, the
22   presence of fake volume.
23   Q.   Those statistical tests are all
24   described in the trusted exchange framework?
25   A.   Yes.

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K. Lu

1
2   Q.   In paragraph 37, you are discussing
3   the techniques to determine an exchange's
4   data quality and you say and I quote, Prior
5   research on these techniques indicates that
6   data produced by natural and legitimate
7   trading activity exhibits a certain
8   distribution or pattern in the data that is
9   different from data produced by artificial
10   and manipulated trading activity, is that
11   right?
12   A.   Yes.
13   Q.   Did you perform that prior research
14   that's described in that sentence?
15   A.   Sorry, can you please direct me to
16   the actual paragraph again, is it in my
17   initial declaration?
18   Q.   Yes, that's in your original
19   declaration, Exhibit 1.
20   A.   I see it now. Can you repeat the
21   question.
22   Q.   The reference to prior research on
23   these techniques, the question was, did you
24   personally perform that prior research or are
25   you relying on someone else's research?

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1   K. Lu
2   A. I have personally reviewed several
3 of the documents that I described in our
4 literature review so I would say that I have
5 firsthand -- I conducted -- I personally
6 conducted this research.
7   Q. You conducted the research by
8 reviewing literature that other people had
9 written?
10   A. Yes.
11   Q. Do you know if any of that
12 literature is academic peer reviewed
13 literature?
14   A. Yes, some of the other papers that
15 I cite in my response I believe are published
16 in academic journals and have gone through
17 peer review.
18   Q. So in paragraph -- still in your
19 original declaration, paragraphs 37 to 43,
20 you are talking about your methodology and it
21 describes you are first choosing which
22 exchanges Coin Metrics concludes are trusted
23 exchanges, is that right?
24   A. Yes.
25   Q. It talks about identifying high

1   K. Lu
2 quality constituent exchanges and high
3 quality constituent markets, is that right?
4   A. Yes.
5   Q. What's the difference between a
6 constituent exchange and a constituent
7 market?
8   A. So an exchange is a trading venue
9 that brings together buyers and sellers and
10 for a single exchange, it may list multiple
11 markets, for example, it may have a Bitcoin
12 USD market and Ethereum USD market.
13   Even for a given asset, it could be
14 traded on multiple markets for a single
15 exchange.
16   For instance, an exchange could
17 have a Bitcoin U.S. dollar market and it
18 could have a Bitcoin tether market so in this
19 example, Bitcoin is traded on both of those
20 markets so that is the primary difference
21 between an exchange and a market.
22   Q. So would it be fair to say that an
23 exchange is a collection of markets or that a
24 market is a subset of an exchange?
25   A. I would say it's accurate to say

1   K. Lu
2 that an exchange is a collection of markets,
3 but not that a market is a subset of an
4 exchange.
5   Q. Can you have a high quality market
6 within what you've labeled as an untrusted
7 exchange?
8   A. Well, quality is relative because
9 for a given asset, it may not trade on all
10 exchanges.
11   I could imagine an asset that only
12 trades on so-called low rated exchanges, in
13 which case, the highest quality market
14 available to us would necessarily trade on a
15 low rated or untrusted exchange.
16   Q. Let me ask it a different way. So
17 let's say you have an exchange that has 50
18 different constituent markets.
19   Is it possible that some of those
20 constituent markets are of higher quality or
21 more trustworthy than other constituent
22 markets within that same exchange?
23   A. I think that's fair to say, yes.
24   Q. So Coin Metrics is analyzing and
25 determining the level of trustworthiness of

1   K. Lu
2 these exchanges by assigning them grades from
3 A to D, is that right?
4   A. Right.
5   Q. That's done through the methodology
6 that's described in the Coin Metrics trust
7 exchange -- trusted exchange framework?
8   A. That's correct.
9   Q. That framework, the current version
10 of it is what is attached as appendix 1 to
11 your original December 27th declaration?
12   A. That's right.
13   Q. If you can turn to that appendix, I
14 think it's appendix B which starts around
15 page 34 of the declaration. The first page
16 says, Coin Metrics trusted exchange framework
17 2.1.
18   Do you see that?
19   A. Yes.
20   Q. If you flip to page 3, it's the
21 page that has the title Release Notes.
22   Do you see that?
23   A. Yes.
24   Q. It says that version 2.1 which is
25 the current version was released -- was

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1   K. Lu
2   created in October 2023, is that right?
3   A.   That's right.
4   Q.   And there is a reference to version
5   2.0 that was released in March of 2023, is
6   that right?
7   A.   Yes.
8   Q.   Was March '23's version, version
9   2.0, was that the original version or was
10   there a version 1.0 or some other prior
11   version?
12   A.   There was a version 1.0 that was
13   published earlier, I can't recall the exact
14   year.
15   Q.   How was version 1.0 different than
16   version 2.0 or version 2.1?
17   MR. GLUECKSTEIN: Objection to
18   form.
19   A.   I can't remember the specifics
20   because version 1.0 was published I think in
21   2020 or something, a substantial amount of
22   time ago, but it didn't contain as many of
23   these statistical tests to detect fake volume
24   and I believe that it didn't have tests for
25   assessing whether or not an exchange has

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1   K. Lu
2   proof of reserves and I believe that there
3   were substantial changes in how we determined
4   the regulatory score.
5   Q.   I know you don't remember the exact
6   date that version 1.0 was released, but you
7   believe it was prior to the petition date of
8   FTX's bankruptcy which was November 11, 2022?
9   A.   Yes.
10   Q.   Were there any other intervening
11   versions of the trusted exchange framework in
12   between version 1.0 and version 2.0?
13   A.   No, there were not.
14   Q.   So version 1.0 was the version that
15   was in existence on the FTX bankruptcy
16   petition date, is that right?
17   A.   That's correct.
18   Q.   Why did Coin Metrics not use
19   version 1.0 to analyze and beat the prices of
20   these digital assets if that was the version
21   that was in existence on the petition date?
22   A.   There have been substantial
23   improvements in the methodology between
24   version 1.0 and version 2.0. I felt that
25   using the most recent version would produce

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1   K. Lu
2   the highest quality results. It represents
3   our latest and most advanced thinking on this
4   topic and the sample period of data that we
5   used in version 2.1 encompassed the petition
6   time.
7   Q.   The data that's used or input into
8   the trusted exchange framework is collected
9   and reviewed quarterly, is that right?
10   A.   Yes, we tried to adhere to a
11   quarterly cadence.
12   Q.   So the version of the framework
13   that you used in December of 2023 when you
14   prepared your declaration would have been
15   using statistics from the exchanges as of the
16   end of Q3 of 2023, is that right?
17   A.   That's right.
18   Q.   Why do you believe that that's an
19   appropriate measure to determine whether the
20   exchanges were trustworthy in November of
21   2022?
22   A.   As I said before, the sample data
23   we used was from I believe Q3 2022 to Q3 2023
24   so it included the petition time.
25   It's also my opinion that the

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1   K. Lu
2   trustworthiness of an exchange, it changes
3   slowly, there is no very abrupt changes. I
4   felt that the fact that the data sample
5   encompassed the petition time and the fact
6   that the trusted exchange framework
7   represents our best thinking on this topic
8   made it the appropriate version to use.
9   Q.   On page 4 of the framework which
10   has the heading, Overall Rankings.
11   Do you see that?
12   A.   Yes.
13   Q.   This is from version 2.1 which was
14   released in October of 2023, is that right?
15   A.   Yes.
16   Q.   So this page shows the grades that
17   each of these exchanges received in these
18   five different categories, is that right?
19   A.   Yes.
20   Q.   And those are data quality, spot
21   transparency, resilience and security,
22   regulatory compliance, API quality and then
23   there is the overall grade?
24   A.   Yes, that's right.
25   Q.   Who decided these would be the five

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1   K. Lu
2   categories that would be measured to
3   determine whether an exchange is a trusted
4   exchange?
5   A.   There wasn't any single individual.
6   The four authors of this report collectively
7   decided after performing our literature
8   review and reviewing some of the initial
9   results.
10   Q.   You are one of those four authors,
11   is that right?
12   A.   Yes.
13   Q.   Were different categories used in
14   prior versions of the trusted exchange
15   framework?
16   A.   Yes, I believe we changed some
17   categories from version 2.0 to 2.1 and
18   they're described in the release notes.
19   Q.   Were there any other categories
20   that the four authors considered for
21   inclusion in the framework, but chose to
22   exclude?
23   A.   I don't believe so.
24   Q.   Did any of the four authors or
25   anyone else from Coin Metrics consult with

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1   K. Lu
2   the various exchanges to determine what the
3   criteria should be?
4   A.   No, we value our independence and
5   editorial integrity, we tried to limit any
6   external influence so prior to deciding on
7   the methodology, the categories, the rating
8   scale, we did not contact any exchanges.
9   Q.   Do any of the exchanges pay a fee
10   to be listed or included within the trusted
11   exchange framework?
12   A.   No, that would be a very severe
13   violation of our company values.
14   Q.   Do any Coin Metrics officers invest
15   in any of these exchanges?
16   A.   I don't know the personal private
17   investments of our officers so I can't say.
18   Q.   Does Coin Metrics have a policy
19   prohibiting its officers from investing in
20   any of these exchanges?
21   A.   We have a conflicts of interest
22   policy at the company. I don't know if that
23   conflict of interest policy specifically
24   addresses this issue.
25   Q.   Do you know if the conflicts of

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1   K. Lu
2   interest policy requires officers of Coin
3   Metrics to disclose to Coin Metrics which
4   exchanges those officers invest in?
5   A.   Again, I don't know if the policy
6   addresses investments. That's my answer.
7   Q.   Do you personally invest in any of
8   these exchanges?
9   A.   I hold stock in Coin Base.
10   Q.   Do you know if any of the VC firms
11   that invested that $50 million in Coin
12   Metrics, if any of those firms have
13   investments listed on any of these exchanges?
14   A.   I don't know the investment
15   portfolio of our VCs so I don't know.
16   Q.   Does Coin Metrics require any of
17   its VCs to disclose to Coin Metrics on which
18   exchanges they invest?
19   A.   I don't believe we have that
20   policy.
21   Q.   So under this framework, you have
22   to be either an A or a B grade to be
23   considered trusted, is that right?
24   A.   It's A or B in the data quality
25   subcategory.

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1   K. Lu
2   Q.   A or B in the data quality
3   subcategory, I'm sorry?
4   A.   Yes.
5   Q.   So it's not the overall grade on
6   the right, it's just the first grade on the
7   left, data quality?
8   A.   That's right.
9   Q.   Which exchanges on this chart were
10   deemed untrustworthy because of evidence of
11   wash trading?
12   A.   I don't use the term untrustworthy
13   in my declaration. I use the term low rated,
14   but the low rated exchanges would be any
15   exchange that is given a C grade,
16   specifically Bitflier, CEX.io, MexC,
17   Poloniex, Bibox and LBank -- sorry, and
18   Upbit.
19   Q.   So for each of those exchanges,
20   Coin Metrics independently determined that
21   there were examples of wash trading occurring
22   on those exchanges?
23   A.   We don't go as far as saying that
24   we have identified specific examples. We
25   applied certain statistical tests which

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 1          K. Lu
 2   suggest the presence of wash trading based on
 3   comparing the distribution of their data
 4   against a distribution we should expect
 5   that's generated from legitimate trading
 6   activity.
 7       Q.   So you don't know that there was
 8   actual wash trading taking place, you
 9   inferred that from the statistical analysis
10   from those exchanges?
11       A.   That's right.  Our tests tell us
12   that the likelihood is high.
13       Q.   And the statistical analysis that
14   reflects the likelihood of wash trading, that
15   is addressed within the data quality category
16   on this chart or is it --
17       A.   Yes.
18       Q.   And those grades are given based on
19   an analysis of the exchange as a whole, not
20   on a constituent market by constituent market
21   basis, right?
22       A.   That's right, it's not on -- we
23   take a sample of data from the exchange.
24       Q.   Can you describe what you mean by
25   take a sample of data from the exchange?
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 1          K. Lu
 2       A.   I believe the actual sampling
 3   methodology is described in the methodology,
 4   but -- and I would have to kind of consult it
 5   to fully describe it, but we -- as it sounds,
 6   we take a sample of the data that we collect
 7   from the exchange and apply the test to that
 8   sample.
 9       Q.   Are there other criteria beyond
10   statistical indications of wash trading that
11   effect the grade under the data quality
12   category?
13       A.   I believe the methodology describes
14   all the tests.  There is one test that looks
15   for the presence of outliers and that
16   specific test does not -- is not related to
17   wash trading.
18       Q.   Is there a certain threshold for an
19   indication of wash trading that has to be
20   reached before the grade is changed from an A
21   to a B or a B to a C?
22       A.   Yes, the actual -- so each
23   individual test in the subcategory will
24   output a numerical score and in some cases,
25   that numerical score is translated into a
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 1          K. Lu
 2   pass/fail score and all of those individual
 3   tests are aggregated to the overall data
 4   quality numerical score and that numerical
 5   score is translated to this letter score.
 6       Q.   So from the sample that you analyze
 7   for any particular exchange, what percentage
 8   of wash trading has to be viewed as
 9   statistically likely in order for Coin
10   Metrics to deem that a fail under that
11   methodology?
12       A.   We don't try to estimate the
13   percentage of wash trading.  The tests aren't
14   designed to do that.  They are designed to
15   examine the distribution of data and we
16   compare that distribution against the
17   distribution we would expect if there is
18   legitimate trading occurring.
19          So, yeah, we don't look at -- we
20   don't try to estimate the amount of wash
21   trading or use that as a threshold in
22   determining whether or not an exchange has
23   passed a particular test or not.
24       Q.   But to receive a grade of A, as
25   many of these exchanges did, that doesn't
```

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```
 1          K. Lu
 2   mean that Coin Metrics had determined that
 3   there are zero instances of wash trading
 4   occurring, is that right?
 5       A.   I think that's accurate, it's a
 6   fair statement, yes.
 7       Q.   So there is some threshold after
 8   which the amount of wash trading leads Coin
 9   Metrics to say that exchange is going to get
10   a B or a C or D and not an A?
11       A.   No, as I said before, we don't try
12   to estimate -- these tests are not designed
13   to estimate the percentage of wash trading on
14   a given exchange.
15          These letter grades are determined
16   largely by the number of tests that an
17   exchange has passed or failed.
18       Q.   Do you know if the sample that is
19   taken from any particular exchange is limited
20   to one constituent market or does it cover
21   multiple constituent markets?
22       A.   I believe it's multiple constituent
23   markets.  I would need to consult the actual
24   sampling methodology that we used.
25       Q.   But it's not all constituent
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 1            K. Lu
 2   markets at that particular exchange, is that
 3   right?
 4      A.  It's not all constituent markets.
 5      Q.  Do you know if any of these samples
 6   included constituent markets that included
 7   the Maps tokens?
 8      A.  I do not believe they included the
 9   Maps tokens.
10      Q.  Do you know if any of the samples
11   included constituent markets that included
12   the OXY tokens?
13      A.  No, I don't believe so.
14      Q.  And do you know if any of the
15   samples included constituent markets that
16   included the Serum tokens?
17      A.  No, I do not believe it does.
18      Q.  So for the Maps token, the only
19   trusted exchange that included a volume of
20   Maps token was the Gate.io exchange, is that
21   right?
22      A.  I believe so.  Again, I have to
23   consult the data to know for sure.
24      Q.  If Maps tokens were traded also on
25   FTX, on MexC and on LBank because those did
```

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 1            K. Lu
 2   not receive the A grade under data quality,
 3   those were not included in your analysis, is
 4   that right?
 5      A.  That's correct.  In this case, the
 6   token traded on at least one of the trusted
 7   exchanges so according to the methodology
 8   that I used, it would use data from a trusted
 9   exchange.
10      Q.  Are you aware that Professor Howell
11   considered FTX and MexC volumes in her
12   analysis?
13      A.  I am not aware.  I don't know the
14   details of her analysis.
15      Q.  If you were told that she
16   considered FTX and MexC volumes for her
17   analysis, would you disagree with her
18   decision to do that?
19         MR. GLUECKSTEIN:  Objection to
20      form.
21      A.  Again, it's hard for me to offer an
22   opinion without having done research on the
23   topic and without having done a thorough
24   analysis of it, but I think if she included
25   it, that would represent a conservative
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 1            K. Lu
 2   assumption because according to the trusted
 3   exchange framework, our assessment is that
 4   MexC likely engages in wash trading and has
 5   noneconomic volume.
 6      Q.  So you would then -- does that mean
 7   you would disagree with her decision to use
 8   the MexC volume information?
 9      A.  No, as I said, it's very difficult
10   for me to offer an opinion without having
11   done the research or analysis.
12      Q.  In your determination of price for
13   the volume weighted median, did you include
14   the volume reported as of the 60 minutes
15   prior to the petition date or a different
16   interval?
17      A.  Yes, the interval we used was the
18   60-minute window immediately prior to the
19   petition time.
20      Q.  Do you know if Professor Howell
21   used a different period for her volume
22   estimation?
23      A.  Yes, I believe she used a different
24   window.
25      Q.  Why didn't you use the same window?
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 1            K. Lu
 2      A.  My interpretation of the assignment
 3   was to calculate prices exactly as of the
 4   petition time and so to fulfill that
 5   assignment, I thought it was prudent to use a
 6   calculation window that was immediately
 7   preceding the petition time.
 8         The 60-minute window is also
 9   utilized in the Coin Metrics' prices so for
10   those reasons, I chose this window.
11      Q.  Do you know why Professor Howell
12   used a different window?
13      A.  I believe it's written in her
14   report, but I really do not know the details
15   of her analysis and that was outside the
16   scope of my assignment, I hadn't really
17   thought about that issue.
18      Q.  Do you know what time window
19   Bloomberg uses to determine cryptocurrency
20   prices?
21      A.  I remember reviewing their
22   methodology at one point, but I can't recall
23   the specific window.
24      Q.  You don't know if it's a 60-minute
25   window or something different?
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 1            K. Lu
 2      A.  I don't recall now.
 3      Q.  In paragraph 45 of your original
 4  report, you're discussing the logic steps
 5  that you used to select the constituent
 6  markets and at the end, you say, If there are
 7  no candidate markets that meet these
 8  criteria, I select the constituent markets
 9  using expert judgment.
10          Are you familiar with that
11  statement?
12      A.  Yes.
13      Q.  What does that mean, that you
14  select constituent markets using expert
15  judgment?
16      A.  So in the steps prior to that, I
17  describe certain exclusion rules where I
18  disqualify, so to speak, certain candidate
19  markets if they do not meet certain criteria
20  such as if they have a volume market share of
21  less than 1 percent or if they have a last
22  price that exceeds 10 percent from the median
23  ask price.
24          These are steps to remove candidate
25  dated markets that I feel like would have --
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 1            K. Lu
 2  would represent low quality prices and in
 3  certain cases, these exclusion rules excluded
 4  all of the candidate markets.
 5          In these situations, I had to
 6  manually select which candidate markets would
 7  be selected and I relied on my experience to
 8  do so.
 9      Q.  Was there any specific formula or
10  criteria that you used when you applied this
11  personal expert judgment to make that
12  determination?
13      A.  I would look at the volume, I would
14  look at the exchange and taking into
15  consideration all of the available data, I
16  would make my determination.
17      Q.  Is there any academic literature or
18  established valuation methodology that
19  endorses the expert judgment method that you
20  used?
21      A.  I don't know if there is one that
22  advocates for the specific method I used, but
23  the general concept of expert judgment is
24  widely utilized in data provider's pricing
25  methodologies and index methodologies.
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 1            K. Lu
 2          If you take a methodology document,
 3  you often find some section on expert
 4  judgment and how it's applied.
 5      Q.  Is there any specific document or
 6  piece of literature that you relied on in
 7  particular with respect to that expert
 8  judgment standard?
 9      A.  No.
10      Q.  In paragraph 46, you are discussing
11  the actual calculation of price.  Is the
12  calculation of price an opinion?
13      A.  No, it's a mathematical formula, a
14  series of statistical techniques.
15      Q.  Why do we need to use this
16  mathematical formula, why do we need to
17  calculate the price at all, why don't we just
18  use the last price on the market with the
19  highest volume?
20      A.  There are multiple prices at which
21  a given asset can trade.
22          For instance, Bitcoin can be traded
23  on a thousand different markets and you need
24  some sort of methodology rooted in common
25  sense and logic to determine how to combine
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 1            K. Lu
 2  those prices in a way that reflects I guess
 3  the market conditions and the reality of the
 4  situation.
 5      Q.  So in your opinion, it wouldn't be
 6  common sense to look at the last price on the
 7  market with the highest volume and designate
 8  that as the most likely price?
 9      A.  I would say that that would lead to
10  a lower quality price than the one that I'm
11  offering in the declaration because it's
12  possible that the market with the highest
13  volume could come from an exchange that
14  engages in wash trading, in which case, the
15  trades on that exchange would represent
16  noneconomic transfers that are not between --
17  that are not between a willing buyer and a
18  willing seller engaged in arm's length
19  transactions.  So the quality of the data
20  from that market could be low and result in a
21  low quality price.
22      Q.  So you said that the calculation of
23  price is not an opinion, it's the application
24  of a mathematical formula, but would you
25  agree that a choice of which formula or how
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1   K. Lu
2   to calculate it is an opinion?
3   A.   Yes, there are multiple ways to
4   calculate price. The methodology that I
5   presented here is based on the Coin Metrics'
6   prices which underwent rigorous backtesting
7   and research and represents Coin Metrics, I
8   guess best thinking on how to calculate a
9   price.
10   Q.   It's your opinion that that's --
11   that using those Coin Metrics' prices and
12   this methodology is the best way to calculate
13   price as opposed to some other methodology?
14   A.   Yes, that would be my opinion.
15   Q.   You understand that your report is
16   being used in connection with a motion by the
17   debtors to estimate claims of different
18   entities that had assets on the FTX exchange,
19   is that right?
20   A.   Yes, I understand that.
21   Q.   Do you agree that to estimate a
22   claim that's the same time period should be
23   used for price as for trading volume?
24   MR. GLUECKSTEIN: Objection to
25   form.

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1   K. Lu
2   A.   No, I don't believe it should be
3   the same. Again, I'm not familiar with
4   Professor Howell's analysis and the general
5   literature of how to calculate the
6   liquidation discount and so on, but I can say
7   that with respect to my work, my
8   interpretation and assignment was to
9   calculate the price directly as of the
10   petition time so that informed the window,
11   the calculation window that I used.
12   Q.   You agree that the task for the
13   court is to estimate the value of claims as
14   of that same time period, right, as of the
15   petition date, right?
16   MR. GLUECKSTEIN: Objection to
17   form.
18   A.   That's my understanding, yes.
19   Q.   And the first thing that you do as
20   part of your calculation is to calculate the
21   volume of observable transactions over the
22   trailing 60 minutes for each of the
23   constituent markets, is that right?
24   A.   Yes.
25   Q.   And just to be clear, when you say

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1   K. Lu
2   the trailing 60 minutes, you are referring
3   from 9:00 a.m. Eastern time to 10:00 a.m.
4   Eastern time on November 11, 2022, is that
5   right?
6   A.   That's right.
7   Q.   Are you aware that Professor Howell
8   excluded entirely all trading data from
9   November 11th and actually from all dates
10   from November 2nd to November 11th because
11   she says that the volumes and prices of
12   digital assets were not accurate after
13   November 2nd?
14   A.   I'm aware of that.
15   Q.   So according to Professor Howell,
16   you were wrong to use the trailing 60 minutes
17   on November 11th, is that right?
18   MR. GLUECKSTEIN: Objection to
19   form, misstates the testimony.
20   A.   No, I do not believe so. As I
21   described in my methodology, I have a method
22   by which to select the highest quality
23   constituent market from a wide pool of
24   candidate markets. I leveraged the trusted
25   exchange framework to do so and I'm confident

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1   K. Lu
2   that the constituent markets that I selected
3   represent the highest quality markets
4   available and are the ones that would result
5   in the highest quality and price.
6   Q.   But even though high quality market
7   would be affected by volatility in that
8   nine-day period relating to events in the
9   news concerning FTX, isn't that right?
10   A.   I have examined that question.
11   Generally, arbitrage was still functioning
12   effectively during this time period. There
13   were small price spreads between exchanges
14   and again, my interpretation of the
15   assignment was to calculate the price exactly
16   as of the petition time and that necessitated
17   the use and of data immediately prior to and
18   at the petition time.
19   Q.   So you say you examined the
20   question regarding the reliability of data
21   from November 2nd to November 11th, is that
22   right?
23   A.   I didn't look at that specific
24   question, but I examined how prices performed
25   across exchanges during, I believe it was the

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 1          K. Lu
 2  two-day window prior to the petition time.
 3      Q.  And is your analysis on that
 4  question included in either your original
 5  declaration or your responsive declaration?
 6      A.  I make a small mention to it where
 7  I state that prices on FTX were significantly
 8  different from other exchanges.  That's the
 9  extent to which it was mentioned in my
10  declaration.
11      Q.  But your examination went beyond
12  that?
13      A.  I looked at other exchanges beyond
14  FTX, yes.
15      Q.  You didn't include your conclusions
16  or your analysis on those other exchanges in
17  your report, right?
18      A.  No, I didn't.
19      Q.  You used that trailing 60-minute
20  window throughout your price calculation,
21  right, not just for volume?
22      A.  I used that window to both
23  calculate the volume and to calculate the
24  inverse price variants.
25      Q.  And the calculation of the inverse
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 1          K. Lu
 2  price variants that's determined based on the
 3  mean price of all trades from the constituent
 4  markets over that same 60-minute period, is
 5  that right?
 6      A.  Yes.
 7      Q.  If there aren't any observable
 8  transactions during that 60 minutes, you just
 9  take the value calculated during the previous
10  second, is that right?
11      A.  No, the previous second is used if
12  there are no trades in the calculation
13  window.  It's unrelated to whether or not I
14  can calculate the mean price with respect to
15  the calculation of the inversion price
16  variants.
17      Q.  So explain -- can you explain a
18  little more how you used the value calculated
19  during the previous second if there are no
20  observable transactions during the 60-minute
21  window?
22      A.  Sure.  So if there are no
23  transactions in the 60-minute window,
24  basically we will try to go back in time and
25  find trades that did occur and calculate the
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 1          K. Lu
 2  price then and then just carry forward the
 3  price, fill forward the price to the petition
 4  time so that that describes that contingency
 5  rule.
 6      Q.  So you are going back in time until
 7  you find one trade or is there a certain
 8  threshold number of trades you have to find
 9  that you will then fill forward?
10      A.  It would be -- it would include any
11  trades between 60 minutes prior to the latest
12  trade to the time of the latest trade so it
13  could include one or it could include more
14  than one trade.
15      Q.  So you go back a full 60 minutes
16  from the first 60 minutes?
17      A.  Yes.  We will basically try to
18  calculate the price as of the time of the
19  latest trade and use the 60-minute window
20  prior to that time to perform these steps.
21      Q.  Professor Howell says in her report
22  that a longer estimation period generally
23  reduces error, is that right?
24      A.  I can't recall reading that.
25      Q.  Do you think that if you used a
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 1          K. Lu
 2  longer window than 60 minutes, it would
 3  reduce error in your analysis?
 4      A.  Not necessarily.  There is a
 5  tradeoff in determining the calculation
 6  window.  On one hand, you want to make it
 7  short because that would result in more
 8  timeliness which is a desirable
 9  characteristic when calculating price.
10          On the other hand, you want to make
11  it long because you want to include more data
12  to make the calculation more robust.  You
13  want to try to find a calculation window that
14  satisfies both considerations and in my
15  determination, I thought the 60-minute window
16  striked the right balance between timeliness
17  and robustness.
18      Q.  Did you perform the analysis using
19  alternative time windows?
20      A.  Yes.  About five years ago when the
21  Coin Metrics' prices was initially in
22  development, we did perform a sensitivity
23  analysis that considered other windows.
24      Q.  What was the result of that
25  sensitivity analysis?
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 1              K. Lu
 2      A.   The result was that I thought that
 3  the 60-minute window struck the right balance
 4  between timeliness and robustness.
 5      Q.   That sensitivity analysis was
 6  performed in 2019?
 7      A.   That's right.
 8      Q.   Was a similar sensitivity analysis
 9  performed here as part of this assignment in
10  connection with valuing the digital assets on
11  the FTX exchange?
12      A.   No, it was not.
13      Q.   So you didn't look at how a
14  different time window would effect the
15  calculation of your prices in this case?
16      A.   In the response, we did recalculate
17  the prices for Maps, OXY and Serum using I
18  believe a 12-hour window which was advocated
19  by Mr. Konstantinidis.
20          So in the response, we did test
21  this and we found that the resulting prices
22  almost didn't change.  It was a difference of
23  less than 1 percent.
24      Q.   But in that testing of our expert's
25  recommendation, that was the only variable
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 1              K. Lu
 2  you changed, is that right?
 3      A.   That's right.
 4      Q.   You didn't go back and look at all
 5  of the other constituent exchanges and
 6  constituent markets on which those tokens
 7  were traded, is that right?
 8      A.   No, we kept the constituent markets
 9  the same in this analysis.
10      Q.   By only selecting volume and price
11  of each digital asset over the immediate 60
12  minutes before the petition filing, isn't
13  there an inherent risk that the data at that
14  time was already affected by material
15  information regarding FTX?
16      A.   It's possible, but again, my
17  interpretation of the assignment was to
18  calculate the price exactly as of the
19  petition time and the prior research I had
20  done indicated that arbitrage was still
21  functioning effectively, at least among the
22  trusted exchanges.
23      Q.   If you had selected a longer
24  interval like Professor Howell did, would
25  that have ensured that the prices and volumes
```

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 1              K. Lu
 2  were in the disproportionately affected by
 3  the FTX news?
 4      A.   I don't know actually if they are
 5  affected at all with the 60-minute window so
 6  I think extending it wouldn't change the fact
 7  that it's my belief that they aren't affected
 8  by the FTX news.
 9      Q.   Have you performed all of the work
10  that you believe is necessary to provide the
11  opinions that you've testified about today?
12      A.   Yes.
13      Q.   To your knowledge, have we
14  discussed all of your opinions or are they
15  discussed in the reports that you are
16  intending to testify about at the hearing?
17      A.   Yes.
18          MR. APPLEBAUM:  Can we go off the
19      record.
20          (Off the record.)
21          (Luncheon recess taken.)
22
23
24
25
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 1              K. Lu
 2          A F T E R N O O N   S E S S I O N
 3          (Time noted:  1:04 p.m.)
 4  K E V I N   L U,  resumed and testified as
 5      follows:
 6  EXAMINATION BY (Cont'd.)
 7  MR. APPLEBAUM:
 8      Q.   Mr. Lu, you understand you are
 9  still under oath?
10      A.   Yes.
11      Q.   I just have a few follow-up
12  questions.
13          You mentioned earlier that you
14  personally invest in Coin Base, is that
15  right?
16      A.   That's right.
17      Q.   How much do you have invested in
18  Coin Base?
19      A.   I think I have something like 175
20  shares.  I don't recall the exact number.
21      Q.   Is that common shares or do they
22  have different levels of shares in Coin Base?
23      A.   It's the common shares that's
24  publicly traded on public exchanges.
25      Q.   Do you know what percentage of
```

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1   K. Lu
2 outstanding shares that equates to?
3   A. It's a very, very small amount.
4   Q. Do you know if anyone else at Coin
5 Metrics invests in Coin Base?
6   A. I don't know if others at Coin
7 Metrics invest in Coin Base.
8   Q. Are you required to report your
9 Coin Base share holdings to Coin Metrics?
10   A. No, that is not part of the
11 conflict of interest policy that we have.
12   Q. Do you believe that owning those
13 shares of Coin Base violates the conflict of
14 interest policy at Coin Metrics?
15   A. No, I don't believe so.
16   Q. Why not?
17   A. Because the situation is not
18 covered under the policy.
19   Q. What level of influence are you
20 able to exert with respect to whether Coin
21 Base is included or not as a trusted exchange
22 on the trusted exchange framework?
23   A. I am not involved in the day to day
24 maintenance of the trusted exchange
25 framework, other than Coin Metrics will apply

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1   K. Lu
2 the statistical tests, but for the most part,
3 these tests are entirely rules based and it's
4 not able to be influenced by any one person.
5   Q. Did you receive any reporting,
6 shareholder reports, offer memorandum,
7 anything like that in your capacity as a
8 shareholder of Coin Base?
9   A. I guess I would be given the
10 standard reports that any other shareholder
11 would receive.
12   Q. Do you rely on any of that
13 reporting in determining whether Coin Base is
14 a trusted exchange within the framework?
15   A. No.
16   Q. So you are familiar with the
17 exchange LBank, is that right?
18   A. Yes.
19   Q. LBank received a grade of C under
20 data quality in the current version of the
21 trusted framework, is that right?
22   A. Yes.
23   Q. Do you recall what grade LBank
24 received in version 1.0 of the trusted
25 exchange framework?

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1   K. Lu
2   A. I don't recall.
3   Q. Do you recall what grade MexC
4 received in the version 1.0?
5   A. I also don't recall.
6   Q. Was FTX included on the rankings in
7 the version 1.0?
8   A. Yes, it was.
9   Q. Do you know what rankings it
10 received?
11   A. I do not recall the exact ranking,
12 but I recall it was considered a trusted
13 exchange.
14   Q. You testified earlier that the
15 methodology that you've created here is one
16 way that you can calculate the price of a
17 digital asset, is that right?
18   A. That's right.
19   Q. What are some other ways that could
20 be used to calculate price?
21   A. Each data provider or index
22 administrator has their own methodology.
23 Many of them are similar, but typically, they
24 will have their own methods for determining
25 which exchanges they want to use as

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1   K. Lu
2 constituents.
3   They may also use different
4 statistical techniques in calculating the
5 price. Some methodologies may use the
6 weighted average or a time weighted average
7 price. Those are other common techniques
8 that I've seen from reviewing other
9 methodologies.
10   Q. Did you consider using any of those
11 other methodologies here?
12   A. Yes. Well, in the development of
13 the Coin Metrics' prices five years ago, we
14 did consider the usage of a weighted average,
15 but our backtesting results indicated that
16 using a weight average would be susceptible
17 to outliers, flash crashes and suspected
18 manipulation, whereas the use and of a
19 weighted median is more robust to these
20 situations.
21   Q. Did you consider any other
22 methodologies for how to calculate the prices
23 for the digital assets in this case?
24   A. No, I mainly just used our existing
25 methodology defined in the Coin Metrics'

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1            K. Lu
2    prices and applied it to this assignment.
3        Q.   When you say the traditional
4    methodology, that includes reliance on the
5    trusted exchange framework, is that right?
6        A.   Sorry, I don't know what you mean
7    by traditional methodology, how is it used?
8        Q.   So when you say you used the
9    similar methodology to what you used to
10   develop the Coin Metrics' prices, does the
11   methodology used to develop the Coin Metrics'
12   prices rely on the trusted exchange
13   framework?
14       A.   Yes, the Coin Metrics' prices also
15   relies on the trusted exchange framework.
16       Q.   Does the Coin Metrics' prices also
17   look only to the data quality category in the
18   rankings to determine what is a trusted
19   exchange or does it use the aggregate grade
20   in the far-right column in the framework?
21       A.   It uses the aggregate grade.
22       Q.   So you are using the trusted
23   exchange framework differently for this
24   analysis than you do with the Coin Metrics'
25   prices, is that right?
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1            K. Lu
2        A.   That's right.
3        Q.   Why did you deviate from what is
4    normally done with the Coin Metrics' prices?
5        A.   I thought that using a hierarchy of
6    exchanges would be more appropriate where I
7    first rely on the trusted exchanges if a
8    given asset is traded on those exchanges and,
9    if not, then I will consider the low rated
10   exchanges and, if not, I will consider the
11   FTX exchanges.
12          I thought this would lead to a more
13   -- to a higher quality price, something
14   that's more defensible and utilizes the
15   highest quality constituent exchanges
16   possible for each asset.
17       Q.   How does excluding the categories
18   of transparency, resilience and security,
19   regulatory compliance and API quality result
20   in more likely to receive a higher quality
21   exchange?
22       A.   In this case, I wanted to place
23   greater emphasis on ensuring that the
24   transactions on the exchanges I used were
25   truly economic in nature and were the results
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1            K. Lu
2    from willing buyers and willing sellers and
3    that is what the data quality subcategory
4    specifically examines, it examines for the
5    presence of wash trading or, conversely,
6    whether an exchange mostly engages in
7    economic trading.
8        Q.   So the other categories are not
9    relevant to determining price?
10       A.   They're less relevant, for example,
11   the criteria for transparency mainly
12   addresses whether an exchange has proof of
13   reserves which means whether or not they can
14   prove that all assets on the platform are
15   backed by actual holdings.  That's less
16   relevant for calculating prices.
17       Q.   Coin Metrics, one of the products
18   it provides is the market data feed, is that
19   right?
20       A.   Yes.
21       Q.   Does that include exchanges such as
22   LBank?
23       A.   Yes, LBank is one of the exchanges
24   in the market data feed product.
25       Q.   Does the inclusion of LBank render
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1            K. Lu
2    the market data feed less reliable?
3        A.   No, no, we cover a wide range of
4    exchanges of varying quality.  LBank happens
5    to be the lowest quality exchange that we
6    cover according to the trusted exchange
7    framework, but I don't think it lowers the
8    quality of our overall data product.
9        Q.   Why does inclusion of a lower
10   quality, in your view, exchange, not produce
11   the quality of the market data feed product?
12       A.   We are just providing data reported
13   by the exchanges.  The users can make their
14   own determination as to what data they want
15   to use from us and we publish the trusted
16   exchange framework as one method that they
17   can use to inform this decision.
18       Q.   Within the market data feed, is
19   there an indication that the data relating to
20   LBank may be less reliable because it's
21   coming from a less trusted exchange?
22       A.   There is no label or indicator in
23   the market data feed that speaks of the
24   quality of an exchange.
25          MR. APPLEBAUM:  I believe that's
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K. Lu

1   K. Lu
2   all the questions -- we would request
3   production of a copy of the conflict of
4   interest policy that was referenced. I
5   will pass the witness.
6 EXAMINATION BY
7 MR. CHAPPLE:
8   Q. My name is Ben Chapple. I'm an
9 attorney with Reed Smith.
10   The ground rules that Mr. Applebaum
11 went over with you at the outset of this
12 deposition apply. We won't talk over each
13 other.
14   If there is anything you don't
15 understand, please ask me to rephrase my
16 question.
17   A. Sure.
18   Q. If you answer my question, I will
19 assume you understand it.
20   Do you understand?
21   A. Yes.
22   Q. Obviously, we covered a lot of
23 ground today. I will do my best not to
24 rehash anything we've already discussed, but
25 there will be some overlap.

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K. Lu

1   K. Lu
2   Do you know what a market maker is?
3   A. Yes.
4   Q. What is a market maker?
5   A. They typically will hold inventory
6 in a wide range of assets and facilitate the
7 buying and selling of that asset to
8 interested parties. They're in the business
9 of providing liquidity to buyers and sellers
10 that desire liquidity.
11   Q. Do you believe there are any
12 competitive market makers with respect to
13 Maps and/or OXY tokens?
14   A. I don't know if there are any
15 market makers that engage in trading of those
16 assets.
17   Q. So you are just simply unaware
18 whether any market makers exist competitive
19 or otherwise?
20   A. Right, there could be or couldn't
21 be, I don't know one way or the other.
22   Q. In connection with your engagement,
23 you undertook no effort to determine the
24 extent to which there are market makers, is
25 that correct?

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K. Lu

1   K. Lu
2   A. That's right.
3   Q. You specifically advised Professor
4 Howell not to use volume data from ZB, Local
5 Bitcoin and LBank, isn't that correct?
6   A. No, I did not specifically advise
7 her to do that.
8   Q. Do you believe that Professor
9 Howell should have used volume data from ZB,
10 Local Bitcoin or LBank?
11   A. Again, this is something that's
12 hard for me to offer an opinion about since
13 it's outside the scope of my work and I am
14 not familiar with the scope of her assignment
15 or the research regarding how to calculate a
16 liquidity discount so for those reasons, I
17 can't say whether or not it's appropriate or
18 not -- whether it's appropriate or not
19 appropriate.
20   Q. So just to be clear, when I asked
21 earlier if you advised Professor Howell not
22 to use volume data from ZB, Local Bitcoin or
23 LBank, just to be clear, I mean directly or
24 indirectly including through counsel.
25   Do you understand?

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K. Lu

1   K. Lu
2   A. Yes, I received questions from
3 Alvarez & Marsal. They presented me with
4 some data which showed outliers in volume,
5 many of which came from the exchanges ZB.com
6 and LBank.
7   In Coin Metrics' experience of
8 maintaining our data feeds with exchanges
9 over the past five years, we've determined
10 that there are several instances where the
11 reported data from ZB.com and LBank is
12 clearly erroneous. We've seen specific
13 examples where volume has spiked by a factor
14 of 8,000 which suggests to us that the data
15 is completely wrong and we observed this both
16 on LBank and ZB.com.
17   I expressed these thoughts to
18 Alvarez & Marsal, but I had no context as to
19 how they were going to use this information.
20   Q. So it was not your intention to
21 advise Professor Howell directly or
22 indirectly whether or not she should use
23 volume data from ZB, Local Bitcoin and/or
24 LBank, is that correct?
25   A. I didn't know the context of how

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1           K. Lu
2   they were going to use it.  I simply received
3   some charts that showed some outliers and I
4   explained to them why they are seeing these
5   outliers.
6       Q.  Cryptocurrency trades 24/7,
7   correct?
8       A.  Yes.
9       Q.  And cryptocurrency traders are all
10  over the world, right?
11      A.  Yes.
12      Q.  Do you agree that the highest
13  activity in cryptocurrency generally --
14  strike that.
15          Do you agree with the statement
16  that the highest activity in cryptocurrency
17  trading occurs between 9:00 a.m. and 4:00
18  p.m. local time?
19      A.  By local time, do you mean a
20  specific time zone or...
21      Q.  By local time, I mean the time zone
22  in which the trader resides, is located
23  during that period of time.
24      A.  Yes, I agree with that statement.
25      Q.  Just to be clear, you agree that
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1           K. Lu
2   the highest activity for cryptocurrency
3   occurs 9:00 a.m. to 4:00 p.m. where the
4   trader is located, correct?
5       A.  It generally follows that pattern.
6       Q.  Under what circumstances does it
7   not follow that general pattern?
8       A.  I don't know.  There could be
9   certain assets that just for some reason,
10  don't follow that pattern.
11      Q.  Sitting here today, are you
12  familiar with any circumstances or specific
13  instances where it did not follow that
14  general pattern that you can point to?
15      A.  I don't know of any specific
16  instances, I haven't looked at the data.
17      Q.  So in light of recognizing that
18  generally, the highest activity in
19  cryptocurrency occurs between 9:00 a.m. and
20  4:00 p.m. local time, why did you choose a
21  60-minute interval?
22      A.  My interpretation of my assignment
23  was to calculate the price exactly at the
24  petition time.  That meant that I chose a
25  calculation window immediately prior to the
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1           K. Lu
2   petition time.  If I chose a different
3   window, that would violate my understanding
4   of the assignment because it would involve
5   data, perhaps a significant time before the
6   petition time.
7       Q.  A point of disagreement between you
8   and Mr. Konstantinidis relates to the
9   liability of trading volume data from Coin
10  Market Cap, correct?
11      A.  Yes.
12      Q.  Coin Market Cap is a data
13  aggregator, correct?
14      A.  Yes.
15      Q.  What does it mean to be a data
16  aggregator?
17      A.  In this context, I mean that it's
18  taking data from a large number of exchanges
19  and applying statistical techniques to show
20  prices and combine trading volume.
21      Q.  Coin Market Cap is a competitor of
22  Coin Metrics, correct?
23      A.  Depends on what you mean by
24  competitor.
25          Internally, we don't really
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1           K. Lu
2   consider it to be a close competitor because
3   the profile of clients that we serve is very
4   different.  My understanding is that Coin
5   Market Cap uses an advertising based and
6   exchange paid business model and primarily
7   serves a retail user base, whereas Coin
8   Metrics, we are exclusively a business to
9   business company that serves institutional
10  investors and other companies in the digital
11  assets industry.
12      Q.  Do you agree with me that Coin
13  Market Cap as well as Coin Metrics' customer
14  base overlaps?
15      A.  No, I said that we don't believe
16  there is much overlap because Coin Market Cap
17  primarily serves a retail user base, they
18  primarily serve the exchanges themselves,
19  that's how they get paid, whereas Coin
20  Metrics serves institutional investors and
21  companies in the industry.
22      Q.  So it's your understanding that
23  Coin Market Cap does not serve institutional
24  investors or others in the industry?
25      A.  They may serve, but I think
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 1            K. Lu
 2   primarily they do not serve institutional
 3   investors.
 4       Q.  You indicate that Coin Market Cap
 5   is not a reliable source of trading volume
 6   data because you believe, based on certain
 7   studies identified in your response, that
 8   Coin Market Cap's volume numbers include a
 9   large portion of fake volume and wash
10   trading, correct?
11       A.  Yes.
12       Q.  Have you performed any independent
13   analysis of the reliability of the trading
14   volume reported by Coin Market Cap?
15       A.  I personally haven't.
16       Q.  Has anyone done so at your
17   direction?
18       A.  No.
19       Q.  Why did you caveat your answer,
20   personally, you have not?
21       A.  I decided to caveat because I
22   reviewed research from other researchers
23   outside of Coin Metrics who have examined the
24   accuracy of Coin Market Cap's volumes and
25   their conclusion is that it's over reporting.
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 1            K. Lu
 2       Q.  You said that you reviewed other
 3   reviewer's findings, is that what you said?
 4       A.  Yes.
 5       Q.  Did you independently assess the
 6   other reviewer's finding or did you just take
 7   the reviewer's finding at face value?
 8       A.  As one example, I reviewed the 2019
 9   Bitwise paper which concluded that 95 percent
10   of the volume is fake and although we have
11   not performed the same exact analysis that
12   Bitwise did, we have used the techniques that
13   they introduced in the paper and applied it
14   to our own sample of data and have found
15   those techniques are effective in identifying
16   exchanges that may engage in wash trading.
17       Q.  So the Bitwise article that you
18   were just mentioning, I will refer to it as
19   the 2019 Bitwise article.
20           Do you understand?
21       A.  Yes.
22       Q.  Following the publication of the
23   2019 Bitwise article, Coin Market Cap made
24   some changes to how it calculates total sales
25   volume, correct?
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 1            K. Lu
 2       A.  Yes, trading volume.
 3       Q.  And, in fact, in footnote 8 of your
 4   response, you note that after the publication
 5   of the 2019 Bitwise article, Coin Market Cap
 6   began excluding a particular exchange from
 7   reported volume calculations if the exchange
 8   had zero fees, provides incentives to users
 9   to trade or if the price outliers are
10   detected, isn't that correct?
11           Footnote 8, paragraph 10 of your
12   report if you would like to refer to it.
13       A.  Yes, that's correct.
14       Q.  When were these changes
15   implemented?
16       A.  I don't know the exact date, but in
17   the subsequent months after the publication
18   of the 2019 Bitwise report.
19       Q.  So the changes would have been
20   implemented prior to the petition date?
21       A.  Yes.
22       Q.  Would an exchange that had zero
23   fees be more likely to have more fake volume
24   or wash trading than an exchange that
25   enforces trading fees?
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 1            K. Lu
 2       A.  Yes, I think an exchange that has
 3   zero trading fees invites wash trading.
 4       Q.  So removing exchanges without
 5   trading fees would reduce the percentage of
 6   fake volume or wash trading, correct?
 7       A.  It would, but there would be
 8   several other exchanges that engage in wash
 9   trade that that rule would not exclude.
10       Q.  Such as?
11       A.  As I explained in my footnote 8,
12   the steps that Coin Market Cap took represent
13   only the most cursory attempts at addressing
14   the fake volume problem.  They are removing
15   exchanges which are engaging the most blatant
16   and obvious forms of wash trading.  It's my
17   opinion that if an exchange wants to engage
18   in wash trading to deceive market
19   participants, they would want to do it in a
20   somewhat covert manner, they want to do it
21   secretly and not let others know that they
22   are doing so in order for their deception to
23   succeed.
24           It's my understanding that Coin
25   Market Cap is still taking no steps to
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1   K. Lu
2   address exchanges that may engage in covert
3   deception and it is still my opinion that
4   Coin Market Cap's volume includes substantial
5   amount of wash trading.
6   Q.   Would an exchange that provides
7   incentives to users to trade be more likely
8   to have more fake volume or wash trade in an
9   exchange that does not offer such incentives?
10   A.   Yes, it would -- an exchange that
11 engages in that process would have more wash
12 trade.
13   Q.   So removing exchanges that provides
14 incentive to users to trade would reduce the
15 percentage of fake volume or wash trading,
16 correct?
17   A.   Yes, but as I mentioned before,
18 that only addresses the most cursory attempt
19 at addressing the problem.
20   Q.   Would an exchange that has price
21 outliers be more likely to have fake volume
22 or wash trading than an exchange that does
23 not offer such incentives?
24   A.   I think that it's unrelated to wash
25 trading. I don't know why Coin Market Cap

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1   K. Lu
2   decides to exclude it. One reason could be
3   that sometimes a ticker symbol may be
4   mismatched between the exchange reported
5   symbol and Coin Market Cap symbol that could
6   lead to an outlier. In those cases, they
7   decide to remove it from the volume
8   calculation.
9   Q.   Have you performed or has anyone at
10 your direction performed any analysis to
11 determine whether any changes implemented by
12 Coin Market Cap after the 2019 Bitwise
13 article improved the reliability of Coin
14 Market Cap's reported trading volume?
15   A.   No, I have not and no one under my
16 direction has done so either.
17   Q.   Are you aware of any studies that
18 analyze the reliability of Coin Market Cap's
19 volume data after the changes we just
20 discussed were implemented?
21   A.   I don't know, but subsequent to the
22 publication of the 2019 Bitwise report, there
23 have been other independent researchers who
24 have studied the same problem using more
25 recent samples of data and they have come to

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1   K. Lu
2   the same conclusion.
3   Q.   Can you identify any of those
4   researchers?
5   A.   Yes. They are listed in my
6   response in footnote 7.
7   Q.   Is Cong one of the researchers?
8   A.   Yes.
9   Q.   Is Le Pennec one of the
10 researchers?
11   A.   Yes.
12   Q.   Is it fair to say that footnote 7
13 includes all of the researchers of which you
14 are aware?
15   A.   No. In fact, if you Google on
16 Google Scholar the terms crypto wash trading,
17 you will find hundreds of results. It's been
18 a well-studied topic in the literature.
19   Q.   Why did you choose to include the
20 specific examples that you did in footnote 7
21 as opposed to any of the other hundreds of
22 examples?
23   A.   These are some of the most highly
24 cited papers. The ones that have achieved
25 the most prominence in the literature.

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1   K. Lu
2   Q.   In your view, did the examples that
3   you included in footnote 7 best support your
4   opinion on this issue?
5   A.   I don't know if they best support,
6   there could be other papers that support it
7   even better, but they're certainly consistent
8   with my opinion that there is a considerable
9   amount of wash trade that occurs.
10   Q.   You note in your report that after
11 the publication of the 2019 Bitwise article,
12 Coin Market Cap has released additional
13 metrics to provide users with a greater level
14 of transparency regarding which exchanges are
15 likely to have noneconomic or fake volume,
16 correct?
17   A.   Yes.
18   Q.   When were these additional metrics
19 first introduced?
20   A.   Again, I don't know the exact
21 timing, but to the best of my recollection,
22 it's in the months after the publication of
23 the Bitwise report.
24   Q.   These metrics include a confidence
25 indicator and liquidity score, correct?

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 1           K. Lu
 2     A.  Yes.
 3     Q.  What is the confidence indicator?
 4     A.  My understanding is only limited to
 5  what is described in their methodology
 6  documents posted on their website, but based
 7  on my review of those documents, the
 8  confidence indicator is based on an internal
 9  model that they have developed.
10         They will estimate in exchange's
11  true volume and they will compare that true
12  volume with the exchange's reported volume.
13         If there is a large difference
14  between those two numbers, they will assign
15  the exchange with a low confidence interval
16  and I believe the confidence interval can
17  take three values, low, medium and high
18  representing the strength of their
19  confidence.
20     Q.  You are using the phrase confidence
21  interval.  Did you mean to say confidence
22  indicator which is what I was questioning you
23  about?
24     A.  Yes, I misspoke, yes.
25     Q.  So is the confidence indicator
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 1           K. Lu
 2  that's used by Coin Market Cap similar to the
 3  trusted exchange grade that Coin Metrics
 4  uses?
 5     A.  I would say it's very different.
 6  Again, I don't know the details of Coin
 7  Market Cap's model because the description of
 8  it on its website is very limited, but again,
 9  based on my review of that document, it only
10  considers very few factors.  It does not do
11  many of the statistical tests that are
12  contained in the trusted exchange framework
13  and the overall aim of the two models for
14  frameworks is different.
15         Coin Market Cap's aim is to try to
16  determine if there is a large difference
17  between their estimated volume and the
18  exchange's reported volume, whereas Coin
19  Metrics' trusted exchange framework is
20  concerned with evaluating an overall score
21  for the exchange considering many different
22  facets.
23     Q.  Did you perform any analysis to
24  determine whether the introduction of these
25  metrics including the confidence indicator
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 1           K. Lu
 2  and liquidity score improved the reliability
 3  of Coin Market Cap's reported trading volume?
 4     A.  I think the introduction of these
 5  two indicators did not improve the
 6  reliability because they are still including
 7  exchanges that are likely to engage in wash
 8  trading.
 9         It's my understanding that they
10  published these scores as a way to give
11  greater transparency to users to allow them
12  to make their independent termination on
13  which exchanges they want to interact with or
14  use.
15     Q.  My question was not whether you
16  believe that the reliability has improved.
17  My question was whether you performed any
18  analysis to determine whether the
19  introduction of these metrics including the
20  confidence indicator and the liquidity score
21  improved the reliability of Coin Market Cap's
22  reported trading volume?
23     A.  I have not done that analysis.
24     Q.  So you hold that opinion,
25  notwithstanding the fact that you have not
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 1           K. Lu
 2  done that analysis, correct?
 3     A.  Yes, because the simple fact of
 4  publishing indicators doesn't change how
 5  they're calculating the reported volume.
 6     Q.  Are you aware of any studies that
 7  analyze the reliability of Coin Market Cap's
 8  volume data after these metrics were
 9  implemented?
10     A.  I'm not aware of any studies.
11  There may have been, there may not.
12     Q.  After the 2019 Bitwise article was
13  published, did Coin Market Cap also threaten
14  to remove exchanges if they did not provide
15  mandatory trading data?
16     A.  I don't know if they did or not.
17     Q.  We've discussed in footnote 7 of
18  your report, maybe it was footnote 8, you
19  referred to the changes as cursory, correct?
20     A.  Yes.
21     Q.  Do you believe removing exchanges
22  that do not provide mandatory trading data is
23  a cursory improvement?
24     A.  If they did make that change, I
25  would still consider that to be only a
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1   K. Lu
2 cursory improvement.
3   Q. When you say the improvements are
4 cursory, are you considering them in
5 isolation or in combination with each other?
6   A. I would say in totality, it is
7 still only a cursory attempt at addressing
8 the fake volume problem so in combination.
9   Q. After the 2019 Bitwise article, did
10 Coin Market Cap announce any data
11 accountability in transparency alliance?
12   A. I do recall that. I remember
13 seeing headlines about that.
14   Q. Do you consider that to be a
15 cursory change?
16   MR. GLUECKSTEIN: Objection to
17   form.
18   A. I think it shows a good faith
19 effort on their part to improve the
20 situation, but still considering that and
21 considering the changes that they did make, I
22 still -- it is still my opinion that they've
23 only made a cursory attempt at addressing the
24 problem.
25   Q. Out of all the changes that we've

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1   K. Lu
2 discussed, which do you feel is the most
3 cursory and the least cursory?
4   MR. GLUECKSTEIN: Objection to
5   form.
6   A. The fact that they were a member of
7 this organization doesn't speak to -- doesn't
8 mean they've changed their methodology at
9 all, so I would say their membership in this
10 organization would be the most cursory change
11 that they made.
12   Q. What do you think is the most
13 advantageous or beneficial change that
14 they've made?
15   A. I would say probably removing
16 exchanges that provide incentives to users to
17 trade.
18   Q. Why do you think that is the most
19 advantageous change?
20   A. If an exchange provides incentives
21 for a user to trade, either through the form
22 of rebates or the form of an exchange token,
23 that obviously provides a monetary incentive
24 for users to use that platform and they would
25 be highly motivated to engage in noneconomic

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1   K. Lu
2 trading in order to receive those monetary
3 rewards so I would think that is the change
4 that had the most significant impact out of
5 the three that we just talked about.
6   Q. I would like to talk about one
7 other change. After the 2019 Bitwise
8 article, did Coin Market Cap exclude from its
9 trade volume any data from exchange that does
10 not enforce the trading fee?
11   A. It's my understanding that they
12 began excluding those exchanges from their
13 volume calculation, yes.
14   Q. What was the effect, if any, of
15 removing volume data from exchanges that do
16 not enforce a trading fee on removing wash or
17 other vacant volume from Coin Market Cap's
18 volume trading data?
19   A. I do not know the magnitude of that
20 change.
21   Q. Do you think Coin Market Cap
22 excluding from its trade volume any data from
23 an exchange that does not enforce a trading
24 fee, do you consider that to be a cursory
25 change?

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1   K. Lu
2   A. Yes, I still consider it to be a
3 cursory change because they are not
4 addressing exchanges which may try to
5 covertly engage in wash trading.
6   Q. Are you aware of any court or other
7 tribunal commenting on the reliability and/or
8 accuracy of Coin Metrics data?
9   A. No, I am not aware.
10   Q. Are you aware of any court or
11 tribunal commenting on the reliability and/or
12 accuracy of Coin Market Cap's data?
13   A. I'm sorry, can you repeat the
14 previous question. I thought you asked about
15 Coin Market Cap on the previous question.
16   Q. Thank you for clarifying. I will
17 repeat my question.
18   My initial question was, are you
19 aware of any court or tribunal commenting on
20 the reliability and/or accuracy of Coin
21 Metrics?
22   A. I am not aware.
23   Q. I will ask you the same question,
24 but for Coin Market Cap.
25   Are you aware of any court or

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1   K. Lu
2   tribunal commenting on the reliability and/or
3   accuracy of Coin Market Cap?
4   A.   I am also not aware.
5   Q.   Are you aware of any court or
6   tribunal commenting on the reliability and/or
7   accuracy of any other crypto trade data
8   aggregator?
9   A.   I am not aware.
10   Q.   Has Coin Metrics ever used pricing
11 or volume data from Coin Market Cap in
12 connection with its commercial offerings?
13   A.   I believe in our indexes for
14 certain assets that we do not cover, we have
15 used Coin Market Cap's circulating supply
16 figures.
17   Q.   Any other instances, and to be
18 clear, I'm including at an earlier point in
19 time, not just now?
20   A.   No, that's the limit to which we
21 use Coin Market Cap.
22   Q.   To be clear, I'm not saying
23 currently use, historical use as well.
24   Is your answer the same?
25   A.   That's right, current and

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1   K. Lu
2   historical use.
3   Q.   Do you believe that data
4   aggregators like Coin Market Cap are reliable
5   sources of price information?
6   A.   For pricing information, I believe
7   their pricing methodology is not as good as
8   other data providers that calculate prices
9   for digital assets.
10   Q.   Are you finished?
11   A.   Yes.
12   Q.   My question wasn't whether it's
13 imperatively better or worse than another
14 aggregator.
15   My question is simple. Do you
16 believe that data aggregators like Coin
17 Market Cap are reliable sources for price
18 information?
19   A.   It's hard to say yes or no because
20 reliability is on a spectrum. I would place
21 the quality of the prices below other data
22 providers on this reliability spectrum.
23   Q.   I'm not asking for a comparative
24 assessment. I'm just asking whether or not
25 in your expert opinion, data aggregators like

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1   K. Lu
2   Coin Market Cap are reliable sources for
3   price information?
4   A.   It would have to depend on the
5   specific use case for how prices are used.
6   If we want to examine a specific point in
7   time, I would not consider them to reliable
8   sources of pricing information.
9   Q.   Do you know what a principle market
10 is?
11   A.   Yes.
12   Q.   What is it?
13   A.   This is a term used in the -- in
14 determining fair value for valuing assets.
15 It generally refers to the venue on which the
16 most trading volume has occurred for a given
17 asset.
18   Q.   Did you identify the principle
19 market when computing the price for OXY?
20   A.   No.
21   Q.   Did you identify the principle
22 market when computing the price for Maps?
23   A.   No.
24   Q.   Why did you not identify the
25 principle market when computing the price for

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1   K. Lu
2   either token?
3   A.   I thought that utilizing the
4   reference rates methodology contained within
5   the coin metric prices was the more
6   appropriate pricing methodology to apply for
7   my assignment, it leads to a more robust
8   price because it's considering prices from a
9   wide selection of trading venues.
10   It also uses a weighted median
11 techniques which our research has shown to be
12 more robust to outliers, flash crashes and
13 suspected manipulation.
14   By contrast, the principle market
15 price would only be calculated from a single
16 venue which would lead to a lower quality
17 price in my opinion.
18   Q.   So in your view, when trying to
19 determine an accurate price, it's best to
20 look at multiple sources of information?
21   A.   Yes.
22   Q.   In your response, you stated that
23 serious practitioners within the industry
24 understand that data aggregators such as Coin
25 Market Cap, Coin Getko and Coin Paprika are

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1              K. Lu
2   not reliable sources for trading volume data,
3   isn't that right?
4       A.  Yes.
5       Q.  Could you please describe what you
6   mean by serious practitioners?
7       A.  By that I mean that people who have
8   worked professionally in the industry for a
9   period of time who have studied the problem,
10  who have traded cryptocurrency assets on a
11  professional basis.
12      Q.  Do you consider Alvarez & Marsal to
13  be a serious practitioner?
14      A.  I don't know the extent to which
15  they understand the digital asset space, I
16  can't really answer.
17      Q.  Are you familiar with the Berkley
18  Research Group?
19      A.  I think I've heard the name, but I
20  don't really know.
21      Q.  Are you familiar with Ernst &
22  Young?
23      A.  Yes.
24      Q.  Would you consider them to be
25  serious practitioners?
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1              K. Lu
2       A.  They're a well-respected big 4
3   audit firm.  I'm sure there are varying
4   levels of understanding with individuals at
5   the company.  I can't really speak as a whole
6   for the company.
7       Q.  Are you familiar with Showbook
8   Pallet (phonetic)?
9       A.  No.
10          MR. CHAPPLE:  We will take a break.
11  We may be finished.
12          (Recess.)
13      Q.  I just have one or two questions
14  for you.
15          We were previously discussing and
16  you clarified that you did not advise
17  Professor Howell not to use volume data from
18  ZB, Local Bitcoin or LBank.
19          Do you remember that?
20      A.  Yes.
21      Q.  But did you testify that you had a
22  discussion with A&M where data from those
23  three sources was erroneous?
24      A.  That's right.
25      Q.  Did any of the erroneous data rely
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1              K. Lu
2   to OXY or Map specifically?
3       A.  I don't know, I didn't look at
4   those specific tokens, but the outliers that
5   we examined in the past have occurred on
6   different tokens.
7       Q.  I'm sorry, you said -- what did you
8   just say at the end.  Could you repeat your
9   answer please.
10      A.  I haven't looked -- I haven't
11  examined the data from those exchanges on the
12  specific tokens, Maps, OXY and Serum.
13          The data quality issues that we
14  observed in the past have occurred for
15  different markets, for different tokens.
16      Q.  For different tokens.  So you've
17  never seen these outliers or erroneous data
18  with respect to OXY or Maps, is that correct?
19      A.  I haven't looked as to whether or
20  not they exist for those tokens or not.  They
21  may exist or may not, I just haven't looked.
22      Q.  So if those outliers did not exist
23  for those tokens, it would be a appropriate
24  to use data from ZB, Local Bitcoin and LBank
25  for purposes of determining the price of OXY
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Page 169

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1              K. Lu
2   and Maps?
3       A.  For determining the price?
4       Q.  Correct.
5       A.  No, I would still want to use my
6   stated methodology where I first prefer to
7   use exchanges that are considered trusted
8   first and then low rated and then the FTX
9   exchanges so the simple fact that if there
10  were no outliers for those tokens, it
11  wouldn't necessarily mean that I would want
12  to use those exchanges.
13      Q.  So if there were no outliers
14  relating to OXY or Maps specifically, would
15  it be appropriate to use the volume data from
16  ZB local, Bitcoin and/or LBank?
17      A.  I really cannot offer an opinion as
18  to whether or not to use the volume or not.
19  Again, I wasn't -- I'm not familiar with the
20  details of Dr. Howell's analysis or the way
21  to calculate a liquidation discount.  I would
22  have to do the research and perform -- and
23  look at the data to offer an opinion.
24          MR. CHAPPLE:  I don't have any
25  further questions.  Thank you for your
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MAGNA
LEGAL SERVICES

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 1              K. Lu
 2     time.
 3        (Time noted:  2:11 p.m.)
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Page 173

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 1
 2              - - -
 3        DEPOSITION SUPPORT INDEX
 4              - - -
 5  Request for Production of Documents
    Page Line    Page Line  Page Line
 6  41   14       137  25
 7              - - -
 8  Stipulations
    Page Line      Page Line  Page Line
 9  None
              - - -
10
    Questions Marked
11  Page Line      Page Line  Page Line
    None
12              - - -
13  To Be Filled In
    Page Line      Page Line  Page Line
14  None
              - - -
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1
2            CERTIFICATE
3
        I HEREBY CERTIFY that the witness,
4  KEVIN LU, was duly sworn by me and that the
   deposition is a true record of the testimony
5  given by the witness.
6
   _____
   Leslie Fagin,
7  Registered Professional Reporter
   Dated:  March 1, 2024
8
9
10
        (The foregoing certification of
11 this transcript does not apply to any
   reproduction of the same by any means, unless
12 under the direct control and/or supervision
   of the certifying reporter.)
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1
2        ACKNOWLEDGMENT OF DEPONENT
3      I,              , do hereby
   certify that I have read the foregoing pages,
4  and that the same is a correct transcription
   of the answers given by me to the questions
5  therein propounded, except for the
   corrections or changes in form or substance,
6  if any, noted in the attached Errata Sheet.
7
8
   KEVIN LU              DATE
9
10
   Subscribed and sworn
11 to before me this
        day of              , 2024.
12
   My commission expires:
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14 Notary Public
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Page 176

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2      ------
       E R R A T A
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   PAGE  LINE  CHANGE
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